The Builder.

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*Islington of Old.**

THE northern suburbs of London, as Mr. Howitt remarks, are amongst the richest in historical and biographical reminiscences. Before the aristocratic class acquired the tendency to spread itself over the western flats, the higher grounds on the north, as well as the City itself, were the chief abodes of the nobles, as well as of the wealthy merchants of London. Hampstead and Highgate bear, even now, amid all the changes of the last two centuries, the traces of this former predilection of the affluent dwellers in, and frequenters of, the metropolis; and Islington, if possessing fewer of the residences of the nobles of secular rank, is still more abounding in the memories of the intellectual heads of society. Its easy approach at all times from the City had made it at once the resort and the abode of a great number and a great variety of those who lived and worked there.

Many names and many derivations of name have been assigned to Islington. Isendune, Isendone, Iseltone, Hisselton, Hyseldone, Yseldon, and Eyseldon, are the various forms of the name which present themselves for Islington at various periods. Till almost a recent date it was a village standing isolated in open fields. Lysons says the parish is three miles one furlong in length, two miles one furlong in breadth, ten miles and one half in circumference, and contains, exclusive of houses, gardens, and wastes, 2,699 acres 37 perches of land, of which 22 acres only were arable, and about 10 acres nursery-grounds. When Doomsday Book was compiled, part of the parish was arable, part common pasture, and the rest consisted of woodland, oak, and beech, affording pannage for sixty swine. The population then consisted of only twenty-seven persons and their families, who were chiefly shepherds, herdsmen, and tillers of the ground.

From the earliest times Islington seems to have been amidst extensive open fields, the resort of shepherds and graziers. The church stood in a field on the highest part of the town, and not far from the woods. It was dedicated to St. Mary, and was considered to be of very ancient date; some imagining that there had been a church there from the Saxon times. When the old structure was pulled down to erect the present one, in 1751, it was in a very ruinous state, but the tower was so strongly cemented as to require gunpowder to rend it to pieces. We are enabled to reproduce a view of it given in Mr. Howitt's book.†

The fields about Islington have, from the earliest times, been a favourite resort of the Londoners for open-air exercise and sport. Distinguished archers here won the game-title of Marquis of Islington, as in other parts they won that of Earl of Pancras, or Duke of Shoreditch. King Henry VIII. himself conferred the title of Duke of Archers, or Duke of Shoreditch, on one of his guards, named Barlo. The distance at which a skilful archer could hit a mark is something wonderful. The longest distances between the marks in these fields were nineteen score, or 380 yards; the shortest nine score, or 180 yards. A curious fact is related of Topham, "the strong man of Islington," who could bend a stout poker round his neck, and do greater feats. He ridiculed the long-bow in a public-house amongst archers as a plaything only fit for children. The archers wagered him a bowl of punch that he could not draw the arrow two-thirds of its length, and on trial he lamentably failed. Such are the marvels of practice. And though archery died out, pleasure continued to live, and sought its aliment at Islington. Thornton, in his "Connoisseur," has described the Sunday excursions of the citizens to this village, to drink ale and smoke their pipes; and Goldsmith has celebrated the tea-parties, and the hot rolls and butter at White Conduit House. Nobody enjoyed such holiday trips into the country near London more than Goldsmith. In what he called his "Shoemaker's Holidays," he often turned his steps towards Islington. Three or four of his intimate friends, says the "European Magazine," rendezvoused at his chambers to breakfast about ten o'clock in the morning. At eleven they proceeded up the City-road, and through the fields to Highbury Barn to dinner. About six in the evening they adjourned to White Conduit House to drink tea; and they concluded the evening by supping at the Grecian or Temple Exchange Coffee-house, or at the Globe in Fleet-street.

The parish of Islington contains six districts, or liberties, named from the manner in which they are situated,—St. John of Jerusalem, Upper Barnsbury, Lower Barnsbury, Canonbury, The Prebend, and Highbury, or Newington Barrow. It contains also the hamlets of Upper and Lower Holloway, Ball's Pond, Battle-bridge, the City Gardens, Kingsland-green, and the greater part of Newington-green. It is also divided into eight ecclesiastical districts, namely,—St. Mary's, St. John's, St. Paul's, Holy Trinity, St. Peter's, St. James's, All Saints', and St. Stephen's.

One of the oldest establishments at the foot of Highgate-hill, just above Holloway, and near to where Whittington's stone is placed, was a Lazar-house, or hospital for lepers. This was one of four such hospitals erected at some distance out of London for the reception of people afflicted with the leprosy, or, as it was called, "the linenless disease."

Mr. Tomlin thinks that the old Whittington Stone was merely the basement of a cross once standing there, of which he gives a woodcut, and that this part of the story of Whittington is a myth. But why so? asks Mr. Howitt; the basement of a cross by the wayside, from which the cross itself was broken, is just the sort of seat of which a wayfarer would avail himself.

In Nelson's time there were some old houses which appeared to have belonged to persons of eminence on the north side of the road at Upper Holloway. In one of them, which became the Crown public-house, and which has long disappeared, there was a tradition that Cromwell had lived. Nelson doubts Cromwell ever having a house here, but thinks he might have visited his friend, Sir Arthur Haselrigge, who had a residence in Islington.

Highbury, famous for springs and conduits which used to supply part of the city before the making of the New River, has always been noted for its elevated situation and its fine views over Stamford hill, Epping Forest, Hornsey-wood, Muswell-hill, Crouch-end, Highgate, Caen-wood, Hampstead, and Primrose-hill. The water from the Highbury springs was conveyed as far as the White Conduit and St. Giles's, Cripplegate, and carried from the conduit to the private houses by men called water-bearers, in vessels called tankards, holding about three gallons each.

Of the New River we have often spoken, and we need not recur to its origin here; nor to the life and doings of Sir Hugh Middelton.

The dangers of the road between London and such suburban villages as Islington were extraordinary in old times. Nelson says that as late as 1770, and later, the roads were so dangerous betwixt London and Islington, that few ventured back to London in the evening, they stayed in the village all night at the Angel, the Lion, or the Pied Bull. Even in the heart of the villages robberies were committed; both carriages and foot passengers were frequently stopped in the most daring manner; and it was usual for people walking from the City in the evening to wait at the end of St. John-street till a sufficient party were collected, who were escorted to Islington by an armed patrol appointed for that purpose. The precincts of Islington were the haunts of such notorious robbers as Duval and Turpin.

Canonbury Tower, or House, the chief part of which still remains, was possessed in the sixteenth century by Sir John Spencer, who was Lord Mayor of London in 1594, and was reputed to be the richest commoner of his time: his town residence was Crosby Hall, and Canonbury House was therefore a sort of country residence at that time. The greatness of Sir John drew upon him dangerous eyes, and a plot was laid by a Dunkirk pirate to waylay and kidnap him for the purpose of obtaining a ransom for him, which it was said would not have been less than 50,000*l*. Sir John, however, escaped accidentally by remaining in London all the selected night, and the pirate and his men had to fly and embark for Dunkirk in the morning. But a more successful pirate turned up in the lover of Sir John's daughter, who stole *her* away in a baker's basket. Sir John resolved to disinherit her in consequence, and on Queen Elizabeth asking him to stand sponsor along with herself to the first child of a young couple who had been abandoned by their father, he resolved to make this child his heir, but to his astonishment discovered that it was his own grandchild whom he had adopted. This is one of the best anecdotes extant of "good Queen Bess."

As London, under the names of Canonbury and Islington, came crowding up about Canonbury Tower and its ample gardens and fair lakes, the proprietors began to desert it for more distant resorts; it became the house of the steward, and the chambers were let as lodgings to gentlemen from London who sought suburban quiet. Newbery, the publisher, had rooms in it, and Goldsmith used to visit him there. As difficulties pressed on Goldsmith, he would remain hidden there for weeks, giving out that he was away in Yorkshire, or elsewhere. He came to like Canonbury House so much, that he had summer lodgings in it, and his literary friends used to visit him there. Sam. Johnson, no doubt, showed his ponderous figure there frequently. He and his associates would adjourn to the Crown Tavern in the Lower-road, and be very jolly. It is said that Goldsmith wrote the "Deserted Village," the "Traveller," and part of the "Vicar of Wakefield," in Canonbury Tower.

Washington Irving visited Canonbury Tower because Goldsmith had inhabited it. He says: "I was shown the very apartment. It was a relic of the original style of the castle, with panelled wainscot and Gothic windows. I was pleased with its air of antiquity and its having been the residence of poor Goldy."

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* "The Northern Heights of London; or, Historical Associations of Hampstead, Highgate, Muswell-hill, Hornsey, and Islington." By William Howitt. London: Longmans & Co. 1869.

† See p. 226.

Irving located his "Poor Devil Author" there, and described what he himself, no doubt, saw. The view given* is from a print in Mr. Gardner's Collection. The "tower" is now surrounded with houses. Within the last ten years some thousands of houses (we speak from personal knowledge) have been erected in Islington.

The Pied Bull, to which allusion has just been made, stands not far from Islington-green, and is said to have been the residence of Sir Walter Raleigh. It is now a public-house, as the name implies. It has undergone many alterations. The Queen's Head, another public-house, in Lower-street, is traditionally said to have been the residence of Lord Treasurer Burleigh, and to have even been occupied by the Queen herself occasionally. When Brewer compiled his "Beauties of England and Wales," in 1816, the "Queen's Head" was one of the most perfect specimens of ancient domestic architecture remaining in the environs of London. It was a strong wood-and-plaster building of three stories, projecting over each other, and forming bay windows in front, supported by brackets and carved figures. The centre protruded several feet beyond the rest of the front, and formed a commodious porch, to which there was a descent of several steps. The superstructure was supported by figures of carved oak, crowned with Ionic scrolls, standing on each side of the entrance.† The interior was in the ancient style of oak panelled wainscot, stuccoed ceilings, and carved chimneypieces. The stone slab over the fireplace of a front room on the ground-floor had a classical design of Diana and Actæon in relief, with mutilated figures of Bacchus, Venus, &c. This ancient building was pulled down in 1829, and a new house, still called the *old* "Queen's Head," erected on the site. We may add to what Mr. Howitt says, that the bas-relief mentioned—a coarse work—and some other of the fittings, including one of the ceilings, are set up in the present house.

The ancient Angel Inn, which was pulled down in 1819 to make way for the present one, exhibited the usual features of a large old country inn, having a long front, with an overhanging tiled roof, and two rows of windows, twelve in each row, independent of those in the basement story. The principal entrance was beneath a projection, which extended along a portion of the front, and had a wooden gallery at the top. The inn yard (of which also we are enabled to give a view), approached by a gateway in the centre, was nearly a quadrangle, having double galleries, supported by plain columns and carved pilasters, with caryatides and other figures. These galleries had, doubtless, been often thronged with spectators of dramatic entertainments, at the period when inn-yards were customarily employed for such purposes.

In Copenhagen-fields, where the Londoners sought amusement and the graver exercise of political agitation, is now placed the extensive New Cattle Market. The enormous inconvenience, cruelty, and public danger occasioned by driving the weekly hosts of cattle and sheep through the crowded streets of the metropolis, had long been a subject of discussion and serious reflection amongst the metropolitan public. A Mr. Perkins, of Bletchingley, in Surrey, seized the opportunity to remove the public difficulty by a bold speculation. He projected and built a new cattle market near Ball's-pond, at a cost of 100,000*l*. It was commenced in 1833, by sanction of an Act of Parliament, and completed in 1836. The object of Mr. Perkins was good, but it was destined not to be profitable, for he received determined opposition from the City authorities, and the site was too near London to obviate, for any considerable period, the mischief it was intended to remedy. It was soon surrounded by a dense population. It was extinguished by an Act of Parliament, to make way for the City scheme of a market in Copenhagen-fields. For this purpose, Copenhagen House and fields, to the extent of seventy-five acres, were purchased by the Corporation of London, and converted into the present New Cattle Market, which was opened June 13th, 1855. Commodious as is this site, it has also the fault of being too near London. It is already environed by houses, and must become more and more so. Eventually, the London *abattoirs* must be placed away in the country, and the meat sent up by railway.

Pentonville Prison was commenced in 1840, as an experiment of a model prison, in which an improved discipline could be carried out. The first stone was laid on April 10th of that year by Lord Lansdowne, attended by several members of Parliament, and other gentlemen interested in the improvement of prison discipline. He also laid the foundation stone of the New City Prison, which superseded the Compter, at Hollo- way, and which was opened October 6, 1832.

In respect to the comparative substantiality of many old buildings, there is but too much truth in Mr. Howitt's remarks while describing those in the northern outskirts of London, but some allowance may perhaps be made for the influence of time in hardening and consolidating cements and mortar: he says:—

"The bricks and brickwork of hundreds of old mansions in town and country, show how far, in this hurrying and money-scraping age, we have gone backward in the quality of brick and bricklaying. And yet this is scarcely a correct expression, for we can go back to no period of our history in which the brick and bricklaying are not far superior to ours. Look at the fineness, the solid smoothness of the brick; at the nice and compact manner in which it is laid; and then turn to the coarse, often very unequally burnt brick of to-day, and the coarse mortar in which it is set, often in rude layers of nearly an inch thick, and the contrast is disgraceful to this age of boasted progress in the arts, but an age in which strength and beauty of building are sacrificed to the sordid calculations of the builder's profits. This was the case in the decline of Rome. No people in their best days built more magnificently than the Romans; none in their decline so shabbily and unsubstantially. Juvenal, describing the buildings of Rome, as well as its luxury and vices, astonishes us by his actual descriptions of London in Rome. In his third Satire he says, you were always having the houses tumbling about your ears, and hurrying to escape from fires:—

'—— incendia, lapsus
Tectorum assiduos, ac mille pericula sævæ
Urbis.'

And again—

'Nos urbem colimus tenui tibicine fultam
Magnâ parte sui, &c.'

The builders ran up their slim walls and daubed them with stucco to make them look decent, as ours do. 'Hence,' says Juvenal, 'the greater part of the houses are kept standing by frail props, which the agent erects to prevent their instant fall. He stops up the old cracks, and assures you you may sleep in peace! But next, your neighbour shouts for water—he is running to save his moveables—the flames are already in the third story, and woe to them who l ve in the garrets!'"

Mr. Howitt's volume is a very entertaining one: of course, it must needs be to some extent a compilation; but it is skilfully done, by one who well knows how to give old facts a fresh interest by presenting them in words of his own.

WHAT IS "CLASSIC"?

WE owe to our Poet-Laureate the recommendation not to

"Deal in *watch-words* overmuch;"

and perhaps the advice is no less applicable to those engaged in the practice of any important branch of art than it is in the wider sphere of political or social life. Many of the misapprehensions, misunderstandings, and cross-purposes which interfere so seriously with real intellectual or artistic progress, arise from imperfect apprehensions of the definite meaning of words, or from the current use of the same word under different significations, constituting what logicians designate as the fallacy of an "ambiguous middle term," through which different parties may arrive at nearly opposite conclusions from apparently the same premises. And such words especially as have been laid hold of as the watch-words and badges of a party, are apt to lose sometimes all trace of their genuine origin and meaning, or at least to be made to include meanings which do not rightly fall under them. And though the terms "Classic" and "Gothic" may be, as has been remarked, little better than a kind of "slang," their constant use as representing two schools of architectural art, supposed to be radically opposed to each other, has had considerable influence in narrowing and restricting the theory and practice of the most conscientious and earnest workers in each of said schools. Each of these words forms a concrete term under which an architect of one school may include all the defects as well as all the merits of the other; and in this manner the word "classic" is especially used by the adherents of the Gothic persuasion. The Classicists are mostly lenient towards Gothic, except to certain modern deformities parading under that name, referred to in a recent article in our columns; but the genuine Goth takes up his song against all buildings of the Classic school, shortly defining a Classic design as "a design with all the life taken out of it," or in some such complimentary language. The Gothic man, however, is not in reality so bigoted in comparison with his Classic brother, as may seem at first sight; he has some reason for his "good hating;" but that reason is in fact mainly based on the ambiguous use of the word Classic, which has most unfairly been made to stand for two schools of architecture, which have in fact very little in common, so far at least as principles are concerned, although in some details they approximate. With the view of promoting the cause of catholicity in our Art, let us endeavour to discriminate between what we may call the true and the spurious application of the word Classic to architecture.

When the revived attention to, and recovery of, the ancient literature of Greece and Rome occupied the attention of the first minds of the period, afterwards to be known as that of the Renaissance, these newly-found treasures became naturally, by contrast with the Mediæval literature which they supplanted, the select or "Classic" models of style, the preference for which was carried (as in most revivals) to such an extent as to render the whole of the new literature of the period but a weak and artificial imitation of the peculiar turns of thought and phrase of the originals; not, be it observed, of the spirit and feeling, but only of the details of the latter. Hence it is that the original literature of this period in Italy, and the productions of the corresponding era at a later date in our own country, have for the most part lost so much of their interest for any but professed students of literature. They are not the expression of genuine feeling; or if they are it is so hidden under a veil of artificial form as to be scarcely recognizable; and when we speak of "Classical literature," we pass over in our minds the reproductions of the antique style; we think, not of Pope or Politian, but of Homer or Horace. But it has not been sufficiently recognized that the architectural history of the period is precisely analogous to its literary history. The revived interest in Greek and Roman literature suggested also the return to the study of their architectural remains, when the fierce flame of Mediæval inspiration had well-nigh burnt itself out; and this return, so far as it bore fruit in actual architectural reproduction, was marked by exactly the same character as distinguished the literary works of the Renaissance. Like the adopted and affected Ciceronic correspondence of the period, wherein the attention to minutiæ of style completely superseded the free and heartfelt expression of genuine sentiments, the architecture of the day, and for a long time after, became a kind of artificial shell consisting of an agglomerate of details from various ancient buildings, of sections of antique architecture super-imposed one upon another; the Roman corruption of Greek architecture being here made the starting-point for a still more unlicensed treatment, whereby the external design became divorced from the internal plan, and from the actual construction, and was in fact in many instances an elaborate piece of scenery erected as a mask to the actualities of the building which it concealed rather than illustrated. Hence it was that the Renaissance architecture lost so much, we may perhaps say lost almost entirely, the architectonic expression, and assumed a sort of decorated furniture or cabinet appearance, endeavouring to compensate for the falsity and superficiality of the general treatment by the elegance of window-dressing, balustrades, terminal vases, and such-like adjuncts. It is not surprising that the earnest minded architects, who initiated the Gothic revival, and who, from diligent study of Mediæval remains, had become penetrated with the love for genuine *building art*, as distinguished from what Professor Kerr has well termed the "superficiation" of the Renaissance, should have learned to look with contempt on the latter as a false treatment of architecture, entirely degrading the art from its true form of expression. The same feeling has now spread from the professional ranks to those of educated people generally. Whilst writing this, we have an instance brought before us of the expression of this feeling, in the course of a story in the current number of the *Cornhill Magazine*: the heroine is sitting in a cathedral,—

"At the foot of one of the enormous stone masses of clustered columns, which looked almost as large as a house in itself, and she gazed up into the mighty labyrinth of arches and roofs above her head. Each part in a Gothic structure seems to grow out of each by a natural and ever-varying sequence,—there is something so living in it; while a Palladian or Italian building obtains height by simply piling a repetition of column and architrave and niche, one upon the other, again and again,—a far more awkward and inartificial manner of accomplishing it."

* See p. 226. † See p. 226.

By "inartificial" we presume the writer means "inartistic;" but the remark is a perfectly just one, and shows a better perception of what constitutes architecture than we commonly meet with in the popular works of fiction of the day. But to represent the Renaissance type of architecture as the embodiment of the Classic school, as the only alternative and opposing school to Gothic, shows a most strange misapprehension of the real relation of the Renaissance to the Antique. To lay claim for the Mediæval style, as its votaries are wont to do, to be considered the constructively truthful and Architectonic style *par excellence*, as opposed to the constructively false and superficial Classic style, is perfectly unreasonable. If we are to admit, as the characteristic principle of Gothic, the genuine and truthful exhibition of construction and the correspondence of external design to internal plan, the Parthenon is on that view as Gothic a building as ever was erected: and to charge the vices of the Renaissance (compensated as they were by much beauty and elegance of detail) upon the Classic school generally as its recognised and inseparable characteristics, is about as reasonable as it would be to decry the value and the truthfulness of Greek and Roman literature because pedantic scholars in the present day amuse themselves by the manufacture of bald and coldly correct Greek and Latin verses—the shadow without the substance.

If, then, we take away the distinction between Gothic and Classic, vulgarly accepted by the adherents of the Gothic school, as representing respectively the truthful and the "sham" in architecture; if we refuse to identify "Classic" with wreathed and trussed window-dressings and interrupted pediments whose two halves flank the inevitable vase; if we cannot even consider that a building is properly "classicked" by the presence around it of rows of columns, "engaged" or otherwise, where do we draw the broad distinction between the two schools? Taking the widest view of the matter, and leaving details for a moment out of consideration, it may be said that Classic and Gothic are in architecture the representation of the two widely opposite spirits which in literature would be called the Classical and Romantic. And what these two schools, whose respective influence can be traced through all the productions of art and literature, really represent, is this:—the Classical is the spirit of repose in feeling and of self-restraint in execution; the Romantic (or Gothic, for we may just now use the terms interchangeably) is that of restlessness and aspiration in feeling, and of licence and freedom in execution. In the first, the thought and soul of the work, though always present, is to a great extent in subordination to the form and execution; or, at least, the conception and execution are precisely adjusted to one another, and there is no attempt to express more in the work than the form in which it is to be embodied will admit of—no attempt to hint at a meaning and feeling imaginable though inexpressible. In the romantic school, on the other hand, there is always manifest a struggle on the part of the artist to convey some indefinable feeling to the reader or spectator, something which he cannot adequately express, and for which all the materials at his command are insufficient. Consequent upon this comes an indifference to form and unity in art, and an attempt to get as near as possible to the feeling desired to be conveyed, by the aggregation of a multiplicity of expressions and forms, crowded one upon another, as Milton says of the verdure of Eden—

"Wild without rule or art, enormous bliss,"

the expressive word "enormous" being of course used in its original Latin sense. The first school expresses most clearly all that it is intended to express, but leaves little for the imagination; the second is more mysterious and suggestive, more stimulating to the imagination, but fails in unity, concentration, and distinctness. The first is pre-eminently the art of high civilization and of positive philosophy; the second, that of imperfect civilization and of metaphysical theology.

Not to theorise beyond the patience of our readers, however, and to return to our own branch of art, we cannot see this better exemplified than in contrasting two such buildings as St. Paul's Cathedral and York Minster, both being disposed in the same manner as to general mass, each having the principal and prominent feature in the centre of the composition. Of course in detail St. Paul's has a great deal of what we have called the "spurious Classic" about it, and it suffers, moreover, from having no advantageous point of view near it. The best idea we have had of the real beauty of the dome was from a photograph taken from the roof of some one of the neighbouring buildings. But, without entering into the question of the intrinsic beauty of the two cathedrals, what strikes us in the aspect of St. Paul's dome along with its western towers, as seen from the most advantageous point of view, is the completeness and unity of the whole composition. As we look at it, the architect's whole idea is before us, carefully studied and worked out; we want nothing further to tell us his intention. In York Minster, on the other hand, there is by no means this finished appearance. Not only are there, as in nearly all Gothic cathedrals, divers irregularities and freaks of treatment in parts, but the central object itself,—the main tower,—conveys to us less the notion of a thoroughly conceived and finished design than the idea that the architect had here done all he could. Thus far he had got in expressing his feeling, when the shortcomings of material and means obliged him to leave the rest to our imagination. It is this uncompleted aspect of a great Gothic work, this hinting of we know not what remaining still to be expressed, which probably suggested to Coleridge the remark that a Mediæval cathedral was "infinity made conceivable." Perhaps there is no more striking instance of the Gothic spirit in its purity than is shown in the west front of Peterborough, called by a well-known eminent critic, "the finest portico in Europe." It may be admitted to be so; but there can be no doubt that it is in fact quite out of proportion to the building, and, if done on a small scale, would be condemned on that ground by every one. But the architect of Peterborough troubled not his mind about proportions; he would have as grand, as lofty a portico over his principal entrance as could possibly be obtained. If practical difficulties prevented his carrying up the rest of his building to a proportionate height, he must submit; but here, at least, was one element of grandeur secured, and there it will remain to be a joy for ever. The same theory explains, if it does not altogether justify, the disproportionate height of the French cathedrals, which rendered it impossible to crown them by a tower adequately proportioned to the substructure, and in which we trace the same effort to give the utmost possible effect to the part of the building which was first worked upon, leaving it an after-consideration whether it would be possible to carry out a complete design on the same scale.

From our present point of view, the rival constructive systems of trabeation and arcuation must be regarded rather as auxiliary than essential to the expression of the Classic and Gothic schools respectively; the latter constructive system growing up naturally when the romantic conceptions of the post-Christian architects went beyond what could be accomplished by the simpler trabeated construction. But it may be doubted whether the characteristics of horizontality and verticality of general design, so long identified with the Classic and Gothic schools respectively, are not in reality of the essence of the two schools. The spirit of repose, which we identified with the Classic school, finds its most natural expression in horizontal composition upon a widely-extended base, and carried to no such heights as render its construction or its permanence a mystery to the spectator. The spirit of unrest and aspiration which belongs peculiarly to the Romantic school, on the other hand, can only be fully embodied in those ascending lines and that restless, soaring growth of vault, and turret, and pinnacle, which the Mediæval builders sent up into mid-air, and poised there by a *tour-de-force* of masonry. Then the distinction between the use of ornament in the Classic and Gothic school must not be passed over. The pure Classic school, whether in literature or art, is always sparing of ornament, and would prefer to sacrifice the most beautiful and elegant of detail rather than for a moment obscure or draw attention from the main composition. The Romantic school has always loved ornament for ornament's sake, and scattered it in very profusion over poem and cathedral, without caring to consider too curiously whether such profusion might not defeat its own end.

In endeavouring to draw a marked distinction between the true Classic school in architecture and its supposed antitype the Renaissance, we shall have done a good work if we may have thereby suggested the removal from the former of the stigma which has been attached to it by so many Gothic practitioners, who have confounded it with the spirit of the Renaissance, and passed one sweeping judgment on both; a judgment partially just, no doubt, from their view of the subject, but founded (unless we are much mistaken) upon false premises. If the leaders of the modern Gothic faction (we take no account of the manufacturers of coloured-brick fireworks) claim that in all truthful architecture the constructive and æsthetic design should go hand-in-hand and illustrate one another, and that the external design should exhibit and grow out of the exigencies and requirements of the internal plan, and of the objects and ends of the building, they may see their principles illustrated in the noblest remains of the pure Classic school. Nor ought the great qualities which specially distinguish the Classic school of architecture to be ignored or disesteemed as they are at present. Granting all the elevating tendency of the aspiring vertical style, it may be doubted whether in the long run the horizontal style does not lend itself better to what can most rightly be termed architectural composition, and whether it is not in fact susceptible of the grander treatment of the two. The qualities of repose and majesty, which belong peculiarly to this style, have always been recognised by the best critics as the highest qualities which a work of art can boast; and in respect of architecture, we may add to these the invaluable attribute of stability, real and apparent, which unquestionably belongs more to buildings in the trabeated horizontal style than to any others; though a horizontal composition is by no means incompatible with the employment of arcuation in the subordinate features of a building, or even with domical roofing. Nor is it in the least to be supposed that a Classical style of design necessarily involves inconsistency between plan and design, and the halving a building into two corresponding sides, like the parterres of a Dutch garden. This misapprehension is unfortunately fostered by the practice of many of those who have called themselves Classical architects, and whose tame and weary productions have gone far to make the word Classic synonymous with Hamlet's three adjectives, "flat, stale, and unprofitable." But the notion of building a town-hall, for instance, with two wings identical in design, although one may be occupied by a grand public room and the other by small offices, belongs not to the Classic, but to the Renaissance. That which really gives the Classic tone to a building, viz., unity and completeness of design, horizontality and consequent repose and stability, and the sparing use of ornament refined and well-studied in character and carefully subordinated to the total effect—all this is just as compatible with the free treatment of ground-plan and grouping according to the dictates of convenience, as is the Gothic style which is supposed to monopolise all freedom of planning to itself. And those who think that to renounce the revived Gothic style in favour of one based on such principles of treatment as we have shown to belong peculiarly to the Classic school, would be to give up the opportunity for the greatest triumphs of their profession, may be reminded that when Martin, in his grand scenes illustrative of the Bible and of Milton, drew so largely on architecture in aid of his effects, he obtained all his grandeur of effect by the employment of horizontal perspective in his imaginary buildings, without a single exception which we can call to mind. What might be made of such commissions as the Law Courts, were a sober and stately style of the Classic model substituted for the piquant and variegated groupings of towers and turrets which always form the main features in such designs at present, we should be curious to see. Our strong impression is that both in these and in smaller and more ordinary buildings, a return to Classic principles, as distinguished from Renaissance, and with due regard paid to peculiarities of climate, and so forth, in the treatment of detail, would result in a style far more suited to the real wants and feelings of the present day than the revived Gothic can be said to be; more especially as we hold that, whatever be the attraction of Gothic for those who love the romantic and picturesque in art beyond all other qualities, the Classic always has been, and when treated in its true spirit always will be, the style which pre-eminently recommends itself to intellectual minds, whether it be embodied in long-resounding verse, or in the silent outstretched perspective of cornice and colonnade.

HOW SHALL WE KEEP OUR HOUSES CLEAN?

WHEN we come to reap the fruits of an extended system of education,—say, in the next generation,—we shall find many matters in our houses will require alteration or re-adjustment, to suit the new order of things. When our domestic servants are sufficiently educated to know somewhat of the structure of the human frame, they will probably object to do very rough work that exposes them to the certainty of present colds and aches, and future rheumatism. We shall have to look thoughtfully at the various appliances and means with which domestic labours are effected, and consider whether they can be improved; whether different materials could be substituted in some cases, or plans contrived in others, by which much of the drudgery of house-cleaning could be done away with. We propose to briefly point out some of the existing domestic tasks that are unnecessarily oppressive upon such of the daughters of men as are maidservants. Just as some other occupations have their peculiar diseases, so are these persons especially liable to colds, sprains, and the complaint known as "the housemaid's knee;" and when they come to be educated and able to choose employment, it is not likely they will prefer one that has the disadvantages of domestic service. And then how shall we keep our houses clean?

The first task of many maidservants after rising is to light fires, and remove the ashes left from those of the previous day. This is a dirty, smutty operation. But it might be shorn of half its discomfort by the application to all fireplaces of the contrivance already used in some kitchens, viz.—a grated well sunk in the hearth for the ashes to fall into. It is, indeed, a matter of surprise that this plan is not in universal use, most especially in drawing-rooms, where the furniture is covered with velvet and satin, and articles of virtu are displayed, which must materially suffer from the matitudinal coating of fine ashes. A fireproof well, a few inches deep, furnished with a tray having sides to it as high as the depth of the well would permit, and handles, so that it could be drawn up and carried away conveniently, would very materially lessen the dirt of the fire-lighting business. The next disagreeable is the black-leading process. We are full of sympathy for the inconveniences suffered by the painter in the use of white-lead, but we only laugh at the victim of black-lead when a maid-servant answers a bell with a smudge of it on her brow. Nostrils, mouth, and throat get choked with the fine powder flying from this smooth-faced article. Can we not think of some pleasant-looking, suitable, and economical material for our fireplaces that would supersede the use of it?

Then look at the immense number of houses which have a flight of stone steps, and a huge landing-stone in front of them, in the streets and squares of London; in the crescents and terraces of fair, bright, inland watering-places, as Leamington and Cheltenham; in quiet country towns; in fine, in every direction. The beauty of these approaches, and, indeed, the character of the head of the house, are supposed to depend on their whiteness; to secure which quality they must be daily scoured and hearth-stoned, in all weathers and all seasons. Surely here is a waste of time and service, which the choice of some other material for an approach to the street-door might diminish. But, besides the steps, there are the brass bell-handles and the brass knocker to polish. Unless these are well rubbed with some polishing paste or powder every morning, they have a dismal, slovenly appearance. Some ten minutes must, therefore, be wasted in thousands of houses by one of their most able-bodied inmates in this frivolous piece of labour, after the still longer process of "doing" the steps is accomplished. It will be seen that future improvements in choice of materials for the items enumerated may considerably alter for the better the nature of the toil demanded of the young working-woman. The scores of kneeling figures in lilac gowns and tiny white caps scouring their masters' door-steps, to be seen in the course of a morning's walk, are not now above the task; but will they like it when they are as educated as our morning governesses? But we have not yet done. Inside the street-door there is another item open to improvement. This is the door-mat. Lift it up, and beneath it there is usually to be found a thick deposit of dust that has filtered through it, whether it be made of india-rubber, cocoa-nut fibre, oakum, or matting. Those who carry it away to beat it are speedily lost to sight from more causes than one. The door-mat is evidently one of the principal deposits of dirt in a house, and requires a masterly management. Would not a well (sometimes now formed the depth of the mat only) similar to that we have described for the ashes, and of the same size as the mat, be of service here? Again, would not a couple of coats of paint on every floor of wood considerably lessen the labour of scouring it, and facilitate the sweeping of it free from the dust that filters through even the best carpets? And should not every wash-house in private houses, as in institutions, be furnished with an open-work wooden floor that would permit of the laundresses' feet being kept dry?

The next difficult indoor operation is window cleaning. Owing to the exact division of sash windows into two equal portions it is next to impossible to clean parts of the panes in some large windows without standing outside; and to be able to sit on the window-sills and bring the process to a successful issue is considered such an improvement on this fearful danger, that we shall be probably thought to be over particular when we find fault with this alternative. But we do find fault with it, and believe that we shall yet contrive for windows to be cleaned as comfortably as swing-looking-glasses.

This generation has already done somewhat in our houses for the next. We have introduced self-acting cooking apparatus, lifts, washing, wringing, and drying machines, extended house-drainage, water supply on our upper floors, and in various other ways lessened indoor labour. But we must not forget that there are those coming after us, and for whom it is in a great measure our duty to provide, as it should be our pleasure, who will look upon some of our appliances as we look upon the cumbrous mangle of our forefathers, or upon the spit that required turning, or upon the bucket of water that had to be lifted from the well and carried from the basement of the house to the topmost bedroom. We, as well as educating our successors, are not to forget to improve the appliances we are to put into their hands.

REMARKS UPON MILITARY REMAINS IN WALES.

THE country west of the Severn and the Dee, which, in a military point of view, may be regarded as Wales, is peculiarly rich in military remains, British, Roman, Saxon, Danish, and Norman. It would seem that in remote times, before the invader had stained the sacred soil, the several tribes were, as they long continued to be, at war with one another, and in consequence each had its own camps and strongholds. At least, this seems to be the only way of accounting for an almost infinite number of earthworks, of no great size and of irregular form, which are found in positions where they never could have been intended for the general security of the country. These are evidently of early date, and no doubt antecedent to any general invasion, either from England or from the sea.

Besides all these, are found a series of larger though less numerous earthworks, which crown the high grounds along the sea-coast, and those inland to the west of the Severn; and occur also along the straths and passes by which the country is laid open; such, for example, as the vale of Clywd on the north, of the Vyrnwy in Mid-Wales, and of the Wye and Usk in South Wales. These are probably of later date, and certainly intended for defence against a more general enemy. On the east they are opposed to that long chain of camps of large area, and constructed with immense labour, which crown the heights and spurs of the Cotswold from the Bristol Avon northwards to Evesham, and which are generally regarded as the works of the advancing Saxons, who, having traversed the plains of England, looked down with delighted and greedy eyes upon the "virgin daughter of Locrine," and her rich pastures of Gloucester, Hereford, and Worcester.

Some of these earthworks are known to be British, and others to be Saxon and Danish; but no certain rules of distinction between them have been established. They are either round or oval, or more commonly of irregular outline, governed by the character of the ground. They are usually on the tops of hills or the crests of an encampment, so as to command a view, and be tolerably secure against surprise. The defences are commonly a succession of banks and ditches, the earth from the latter being thrown inwards; and these defences are deeper and in greater number on the more accessible sides. There are seldom more than two entrances; often but one; and these wind obliquely through the defences, so as to check the force of a rush of men, and thus guard against a surprise. There is but seldom a supply of water. They seem to have been intended rather to resist a sudden attack than to hold out against a blockade. The banks are in some instances of broken stone, and occasionally, though very rarely, of rude dry stone walling. Some of these camps are of very large size. Dolebury, on the Mendips, is above 1,000 yards in length; and its banks, of broken stone, are from 10 ft. to 15 ft. high.

These camps, however extensive, all appear to be the work of barbarous or unscientific nations; but mixed up with them are found other works, commonly indeed of earth, but placed and designed by men who were evidently no novices in civilized wars, and were proficients in the arts of castrametation. These were the Romans, whose camps are usually placed, not on the tops of hills or in inaccessible places, but in the plain and near a stream or source of water. They moved with wheel-carriages and cavalry in their train, and trusted to their discipline to guard against surprise, the favourite tactic of the savage.

The Roman camps, instead of being round or oval or of irregular form, are usually rectangular, constructed with great regularity, and provided with several openings, whence an assailant could be outflanked. They were also divided within, according to certain well-ascertained rules.

The Romans, moreover, coming not merely as invaders, but as future colonists, busied themselves in making lines of high road, upon which their camps are posted, and by means of which their communications were kept open. At certain intervals they converted their camps into fixed stations, regularly walled in, many of which, like Caerwent, Caerleon, Neath, Cardiff, Gloucester, and Chester, became the *nuclei* of large villages, towns, and cities.

These earthworks, with occasional Roman defences in masonry, were the only military works that preceded the invasions of the Normans in the eleventh and twelfth centuries. There is no existing evidence that either Celt or Saxon in Wales ever built a military structure in brick or stone and mortar. The instances cited on Penmaer-maur, Carn-Goch, and elsewhere, only prove the poverty of the evidence adduced. These are enclosed with loose dry stone walling, of considerable thickness, and which at Carn-Goch contain certain cists or cavities in which the natives probably hid their valuables and possibly themselves. Of a regular wall still left of a tower or castle, no trace has been recognised.

The influence of the Norman conquest was speedily felt on the Welsh border. With the activity of all great generals, William at once saw the importance of securing the Severn and the Dee, with a view to the occupation of the marches in strength, and the conquest at some future time, of the rocky and impregnable country beyond.

He at once took possession of Gloucester, Hereford, Worcester, Ludlow, Bridgenorth, Shrewsbury, and Chester, and directly, or by the agency of his greater barons, fortified these Saxon towns, and placed a strong castle in each.

At the same time he,—and the policy was pursued by his son,—encouraged these barons to invade Wales, selecting the more open and weaker parts to the south and west, and the broad strath or vale of Clwyd, which forms a sort of approach to the great strongholds of Snowdon and Anglesea. Thus the Earls Palatine of Chester, second only to their sovereigns in rank, and sometimes their superior in force, established castles at Mold, Flint, Rhuddlan, and Diganwy, extending up to the Conwy river, and securing access from the north by sea. In like manner the De Clares, of the race of Strongbow, in the south, placed the base of their operations in their impregnable castle of Chepstow, upon the mouth of the Wye, and having married the heiress of Fitzhamon the conqueror of Glamorgan, established their power along the plain and fertile country between the hills and the Bristol Channel, and advancing along the old Roman *via maritima*, maintained a chain of fortresses, of which Newport, Cardiff, Neath, Kidwelly, Llanstephan, Caermarthen, and Llangharne, each commanded the mouth or passage of some considerable river or inlet, while Tenby, Pembroke,

Manorbeer, Carew, and Haverford, secured the peninsula of Pembroke and the haven of Milford, and thus not only commanded all the approaches by the Bristol Channel, but laid the foundation of a secure connexion with Ireland.

Ludlow and Shrewsbury, like Chester and Gloucester, also served as bases for further conquests. Ludlow was the head-quarters of the lords of the Middle March, the Mortimers, De Lacys, Talbots, Dinans, and Fitz-Warines. Shrewsbury was the fortress of Robert de Belesme, of the great house of Montgomery, to whom belonged the proud distinction of giving name to a Welsh county, instead of, like other lords, deriving a title from it. From Shrewsbury issued those warriors who founded Pool Castle, Aberystwith and Cardigan, Kilgaran, Newport, and, indeed Pembroke, although that magnificent fortress owes its chief illustrations to its later lords of the houses of De Clare and Mareschal.

In addition to these main lines of occupation, the open valleys of the Usk and the Middle Wye were occupied by the great barons Fitz-Osbert and Newmarch, who established their power about Brecknock, Abergavenny, and Usk, and whose estates ultimately vested in, and were augmented by, the Bohuns, whose earldoms of Hereford and Essex balanced even the enormous influence and royal connexion of their rivals, the De Clares, with their earldoms of Gloucester and Hertford.

The grasp thus taken upon Wales was held with variable strength, according as the Marchers were supported by or at variance with their sovereign; but, with some intervals, it was retained during the reigns of the two first Henrys, and was, on the whole, strengthened during that of Henry III. The castles, often taken, and sometimes ruined, by the Welsh, were regained and strengthened, and in South Wales one new castle of great magnitude (Caerphilly) was erected by the De Clares in the last year of the king.

But under Edward I. the English power was not only consolidated, but extended, and was wielded far more by the king than by the Marcher lords. North Wales and Anglesea were conquered, and the conquests were secured by the great castles of Bere, Harlech, Caernarvon, Beaumaris, and Conway, the ruins of which still attest the wealth and generalship of Edward, and the skill of the military engineers and masons of his day.

With these great works of Edward I., the military history of Wales is brought to a close. The Welsh fought valiantly in the English ranks at Agincourt, and, under the house of Tudor, became gradually incorporated into the British Empire, of which they have ever approved themselves, both in peace and war, very loyal and valuable constituents.

Such, then, very briefly related, are the circumstances under which the great fortresses of Wales were constructed. I now arrive at the consideration of the works themselves.

English, or rather Mediæval, architecture, has only been scientifically studied during the last thirty years, and military architecture for a much shorter period. Rickman altogether declined to notice castles, and they have by no means shared in the flood of light which has been directed upon our cathedrals. What is wanted are good ground-plans, and scientific elevations and details. Grose gives few plans, and his plates are poor. Buck, though better, is out of perspective and inaccurate in detail. The plates in King's "Munimenta" are as excellent as his letterpress is worthless. The plates published by the Society of Antiquaries are also excellent; and recently Mr. Parker's valuable volumes have supplied much towards a complete study of the subject; and it is difficult to speak too highly of the abstract of the great work of Viollet-le-Duc, which has appeared under his care.

Much, however, remains to be done. Castles are usually in a ruined state. They are but seldom ornamented; and very commonly all the ashlar work has been removed, and nothing remains but the rubble and concrete of the interior of the walls, without regular form, and affording but little information as to age. A castle is essentially a defensive work. Its uses are to enable a small number of men to resist or beat off the attacks of a larger number, and to secure a safe place from under cover of which an army may retire, or from which it may advance.

The great point in the design of these works, is so to arrange them that those who are approaching a wall to breach it shall be open to the fire of as large an extent of rampart as possible; and as they reach the wall shall be exposed, not merely from the top of the point attacked, but from each side of it. In other words, the besiegers should be unable to attack without being exposed to a superior and concentrated fire from the besieged; and the besieged should be sheltered.

Now a round tower—supposed to be a very old form of castle—least of all forms fulfils these conditions; for it is clear that the besiegers, while approaching, can only be fired at from that part of the wall exactly in front of them; and when they reach its foot they are safe from all missiles except those thrown down from its top, while their supporters could, by a steady and sustained flight of arrows, prevent any one from appearing on the battlements.

The only advantage of the round tower is its passive strength and absence of all angles, so that it is not easily breached; and when mined, does not readily crack and fall.

The square tower is rather more defensible, since a broader part, that is a greater length of rampart, could be manned for the annoyance of the assailants; but the defendants, it will be observed, are quite unprotected from arrows from without; also, when the attacking party have reached the foot of the wall, they are safe from all but missiles from above.

From these considerations it will be evident—and it was evident to all the military nations even of remote antiquity—that every wall should have flanking defences, that is, towers or bastions projecting from the face of the wall, and capping its angles. In such an arrangement the curtain or wall intermediate between the flanking towers, which, being the weakest, would naturally be selected for breaching, is so protected as to be almost unapproachable; and even when reached, the assailants are exposed to the near and direct fires of the defenders, one on each side; and these defenders, as they shoot from a flank, are not at all exposed to arrows coming from the front. This is the system of flanking defences, well understood indeed by the Romans, and from them adopted by the Normans, but far more extensively put in practice by their descendants in the twelfth and thirteenth centuries, and only brought to perfection after the introduction of gunpowder.

The Norman castle usually consisted of a walled enclosure, the wall being flanked with towers, generally square, and in the enclosure a building of far greater strength than the outer part, and known as the keep. The Norman keep, from its great height and size, towered above and gave character to the whole fortress; and, from the immense thickness of its walls, it has in many cases descended to the present day entire or nearly so. Most commonly these keeps were quadrangular, with a door on the first story, and outside they are strengthened by pilaster strips, while all the angles become square turrets, though of very slight projection. The first-floor is generally a hall. There is often a chapel, and the access to the different floors is by winding stairs at the angles, and by galleries and small chambers in the thickness of the walls. The well is usually carried up through the wall, having an opening for the drawing of water, in each story. I need only name as generally known the keeps of Dover, London, Canterbury, Rochester, Guildford, Porchester, Colchester, Kenilworth, Richmond, Banborough, Prudhoe, Newcastle, and Carlisle. There are about thirty of them in England, and many in Normandy.

In Wales and the Marches they are rare. Those of Bristol and Gloucester have long been destroyed, as has that of Haverford. At Chester there is a square keep, and at Ludlow, though this latter is mixed up with later buildings. There are square Norman keeps at Goodrich and Chepstow, on the Wye, and a small one at Ogmore, on the river of that name. At Penlline, also in Glamorgan, is a fragment with herring-bone masonry.

The Normans did not, however, always build square keeps. Sometimes, within the enclosure, is a circular mound of earth, and upon this they placed a circular, or, more commonly, a polygonal shell of wall, of considerable thickness, against which, in the side, buildings were erected, leaving an open court in the centre. Where these mounds are seen it is unusual to find a square keep. Their origin is doubtful. Had the Normans thrown them up they could scarcely have built upon them, and yet most of the masonry they carry is Norman, of a very solid character. In Normandy there are about forty of these mottes or mounds within seventy miles of Caen, and they are not uncommon in England. There is one at Arundel, carrying a polygonal shell of wall, and they occur at Oxford, York, Totnes, Bedford, Marlborough, Hinckley, Tamworth, Warwick, and Christchurch, and there is a very fine one at Wallingford. It is now supposed that they were thrown up by the Saxons, and were intended to be fortified with palisades. In Wales they are very rare. There was one at Hereford, there is one at Caerleon; but the grandest military mound in Wales proper is at Cardiff, where, though crowned by a Norman wall, it is connected with earthworks of a Roman character.

There are, however, in many parts of Wales detached mounds, surrounded by a ditch, and which seem to have been thrown up to enable a small body of men to hold out with certainty for a limited period. They were, no doubt, stoutly palisaded at the summit, and probably outside the ditch. There is one at Gelligaer in Glamorgan, a fine one near Towyn, and one near Newport in Cardigan; but they are rather liable to be confounded with sepulchral mounds or barrows.

The north Welsh castles rarely present anything of the Norman type; and those in South Wales, though generally earlier, seldom, in their present form, are older than the times of Henry III. Some of the earliest, as, for example, Fonmon, and, to judge from its foundations, Sully, contain a variety of the square keep; but the general tendency of the Early English period in Wales was in favour of a large and often irregular enclosure with high curtains and round flanking towers, in which the peasants and the cattle could be received and sheltered during any sudden incursion of the Welsh. Manorbeer and Dynevor, Penmark, Whitecastle, and Kilgaran, seem to have been such places, and Morlais, though of the reign of Edward I., illustrates this type.

During the post-Norman, or Early English, period, at the end of the twelfth or early in the thirteenth century, there seems to have been a tendency to build detached round towers, and sometimes castles with circular keeps, such as Conisborough. Without touching upon the vexed question of the Cornish keeps, I may mention the fine circular keep of Pembroke, the towers of Penrice and Caldecote, and that of Tretower, near Abergavenny. There are also the foundations of a large round tower, decidedly Early English, at Whitchurch, near Cardiff, and the tower of Bronllys, in Brecknockshire, has recently been illustrated in the pages of the "Archæologia Cambrensis."

This circular style, though employed largely in France, and long continued in the flanking towers of castles, and on town walls, was not much affected for detached castles in England, but the reign of Henry III. witnessed a great improvement in castle building, which was carried on and perfected in that of Edward I.

This new style, now known as the concentric or Edwardian type of castle, exhibits a great advance in military knowledge, no less than in architectural skill. Although the structures are more extensive, and on a far larger scale than in the Norman period, the walls are not so massive, and there is far more economy of material.

The keep, whether square or round, disappears, and in its stead is found a large central court, usually rectangular, with drum towers capping the angles, a hall and offices on one side, and at each end a gatehouse. Outside this inner ward or bailey is usually a second enclosure, also rectangular, capped with round towers at the angles, and sometimes with intermediate towers on the curtain wall, and also, like the inner ward, having two gatehouses. This is the middle ward.

The outer ward is seldom if ever complete. It usually consists of a sort of outwork, sometimes of earth, and often includes one or more barbicans, or defences outside the moat. The smaller specimens of these castles have only a tendency towards the concentric arrangement, but the larger examples, such as are found both in North and South Wales, exhibit it very strongly.

Moreover, most of these castles were intended to lodge some very great lord, the sovereign's deputy, and occasionally the sovereign himself, and although security was their first object, it was by no means, as formerly, their only one, and was combined with great architectural splendour, and with arrangements for the display of hospitality on a large scale.

Many of these concentric castles are not

original works, but are formed by the addition of exterior walls to an older keep. At Porchester is a large rectangular space, still enclosed within what are usually regarded as Roman walls and buttresses. In this stands a fine Norman church, probably on the site of the Roman sacellum; and at one angle is a very fine Norman rectangular keep, of unusual size and height. In the Edwardian times this keep has been isolated from the great court by a wall and buildings, converting the structure into a sort of concentric castle.

Chepstow in like manner has had Early English and Decorated wards added above and below the Norman keep. The castles of London and Dover are still finer and more perfect examples of the conversion of a Norman keep into a perfect concentric fortress.

Kidwelly, a very curious Welsh castle, is, in its present form, concentric. It is in plan almost a semicircle, the river Gwendraith forming the chord, and a deep artificial fosse the arc. It has a celebrated chapel.

Perhaps, having regard to its area, its architectural detail, and the number and completeness of its defences, Caerphilly is the first concentric castle in Britain, as Beaumaris is the second.

Caerphilly covers about 30 acres of ground. It has three distinct wards, seven gatehouses, of which five are of large size, and about thirty portcullises in different parts of the work. Its hall and kitchen are on a grand scale, there is a grand guard-chamber or governor's hall in each of the two interior gatehouses, and within the walls are fish-stews and a water-mill. The north and west sides are covered by large earthworks, skilfully designed and placed; and the south side was protected, as at Kenilworth and Leeds, by a spacious lake, now drained, but which once filled the moats, and flooded also the low ground on the north. The grand front towards the Rhymny is 250 yards in length, and from 20 ft. to 60 ft. in height, with a grand central gatehouse, and large postern gatehouses at the end of each flank. The pier and foundations of the barbican of the grand entrance remain, and show that the drawbridges defending it must have been of unusual span and breadth.

Caerphilly was constructed towards the end of the reign of Henry III., by one of the De Clares, Earls of Gloucester and Hertford; and large additions were made to it by Hugh le Despenser the younger, who garrisoned it for Edward II. in the last year of his reign.

Caerphilly is especially remarkable for the jealous care with which it is guarded against surprise. Each tower and each gatehouse is isolated both from the court and from the walls by regularly portcullised doorways.

Beaumaris is rather more regular in form than Caerphilly, though of less magnitude. Here the hall is in one of the gatehouses, and the chapel occupies, as at Kidwelly, a mural tower. The inner walls are of unusual height and thickness, and contain two very curious tiers of triforial galleries, of which the lower covers a magnificent series of sewers. There are but two concentric lines of wall. The outer line is represented by a sort of spur work, which extends towards the sea, and commanded the whole port. Beaumaris was built by Edward I., and marked the establishment of his power in North Wales when he turned the flank of Snowdon.

Harlech is of the same class. Caernarvon and Conway, both works of great size and beauty, and also the work of Edward, are scarcely in plan concentric, but are rather grand examples of the curtained and towered inclosure introduced by Henry III., and both combine the accommodations of a palace with the defences of a castle.

With the conquest of Wales by Edward I. terminates the history of Welsh military architecture. Many of the castles were subsequently altered, and some converted into dwelling-houses; but, with the brilliant exceptions of Raglan and St. Donat's, we have not much of purely military work of later date than the middle of the reign of Edward I.

To recapitulate, we have to observe, in Wales, the Norman castle of Cardiff, with its earlier mound; the rectangular keeps of Goodrich, Chepstow, Ludlow, Ogmore, and Penlline, and, rather later, of Fonmon. The circular keep of Pembroke, and the towers of Tretower, Caldecot, Bronllys, and Whitchurch.

Next we have the fortified enclosures of Kilgeran, Bere, Caldecot, Dynover, Whitecastle, Llanstephan, Tenby, Dinas-Bran, Manorbeer, and some others.

Finally, and chiefly, we have the grand concentric structures of Caerphilly, Beaumaris, Kidwelly, Harlech, and their contemporary structures of Caernarvon and Conway, and in South Wales of Morlais and Dinas by Talgarth.

Besides these well-marked and, more or less, well-known examples, there are scores of castles in Wales of which parts, usually gatehouses, remain, and many of which having been originally founded by the alter Normans, and afterwards burned and destroyed, exhibit what the skilled antiquary will recognise as traces of the Early English, Decorated, and Perpendicular periods, down to the partial restoration in the Tudor manner, which followed upon the extensive devastations of Owen Glendower.

In the grand divisions of British military architecture, to Wales must be allotted, as peculiarly her own, the Edwardian period. The Norman keep, whether square or as a shell upon mounds, must be studied in England or in Normandy, and the circular tower keeps chiefly in France; but even Windsor, Warwick, Dover, and the Tower of London, though rich in historical association, and possessing individual parts of surpassing grandeur, can by no means, in military completeness and simplicity of plan, be compared to those noble fortresses which girdle the skirts of Snowdon, or rise out of the velvet meads of Glamorgan. C.

PROPOSED INFIRMARY FOR LAMBETH.

THE guardians of St. Mary's, Lambeth, invited some twenty-two architects to send designs for the infirmary proposed to be erected near Kennington-road, offering three premiums, 150*l*., 100*l*., and 50*l*., for the best, second best, and third best respectively: the successful competitor, if required, to carry out the works for 1,200*l*., less the amount of premium, but not to be entitled to any premium or payment, unless a contractor would undertake the work at a sum not being more than 10 per cent. above the architect's estimate. The accommodation required is for 600 patients,—250 males and 350 females. In addition to the infirmary, the guardians asked for a block plan of a workhouse for 1,500 inmates, in order to show that the infirmary, as planned, would not render it impracticable to provide a workhouse on the site hereafter, and they offered a separate premium of 50*l*. for the block plan which should seem to them to be the best.

Twelve of the twenty-two, as we mentioned recently, have responded, and their designs have been hung for some time in Lambeth workhouse. The injurious farce has been played of covering up the names of the designers affixed to the various drawings, and substituting in each case a letter, from A. to K.; neither of the two under those letters, by the way, being without merit. One of the least important results of resorting to the pseudo-anonymous appears to be that the descriptive particulars sent by the architects are not appended to the designs, probably because the name of the designer in each case appears in them.

The architects have been left in doubt as to the desired mode of approach, and some (of which L, a compact plan, may be taken as type) have thought it necessary to have the entrance front of their buildings on the narrow width of the land, next Pleasant-place; while others, of which we will point to G as an example (a plan well deserving attention), have availed themselves of a roadway newly acquired by the guardians, leading from Renfrew-road to the long side of the land, and placed their main front there.

The guardians unfortunately say in their Instructions, "Some of the wards may be provided to contain four rows of beds;" and this has betrayed many of the architects into submitting plans which ought on no account to be adopted. For bedridden patients and convalescents a double ward may be endured; but now to erect a double ward for the sick would be so entirely opposed to the teaching of experience and to the public opinion on the subject which we have aided to form, that we cannot for a moment suppose the Lambeth guardians contemplate such a step. Should they do so, an over-ruling power should be appealed to. In design H, as in some others, the double wards are confined to the bedridden cases; and in design K, on which much pains have been bestowed, an alternative plan avoids double wards altogether, and is commendable accordingly.

It may be noticed that some of the competitors have submitted complete designs for a workhouse, though asked for only a block plan.

ST. JAMES'S CHURCH, BOLTON.

ST. JAMES'S Church, Bolton, has been opened by licence of the Bishop of Manchester. In 1864, the charitable trustees under the will of the late John Barrow, having at their disposal a considerable sum of money left by Mr. Barrow, towards the building fund, advertised for designs. A very large number were sent in under cipher. From amongst them, two were selected for consideration, which were found to be by the same architect, and ultimately one of them, with a central steeple (as now carried out), was adopted. In the first instance, it was proposed to build, at the cost of 5,000*l*., a church to seat 1,000 people. But afterwards, in consequence of subscriptions not coming in as liberally as was hoped, it was decided to reduce the cost somewhat, and the accommodation to 800. However, before the builder's estimates were asked for the plans were again enlarged in various ways, so that the church as now built will accommodate nearly 900 persons on the ground floor, there being no galleries. The contract was taken by Messrs. H. & S. Warburton, of Harpurhey, Manchester. The ground plan is cruciform. There is a western porch, rather longer than the width of the nave, and so arranged as that one door may serve for entrance, while there are three to allow of speedy exit. At the north end of this western porch is the baptistery, which opens into the church with a couple of narrow arches resting on a central pillar. The nave is of more than ordinary breadth, and is marked off from the aisles by four arches on either side. The chancel, which terminates towards the east with a semicircular apse, is 43 ft. long by 20 ft. wide, the steeple being built over the western half of it. The choir seats are under the steeple, and the flat boarded ceiling of this part is considered to be well adapted for sound. To the north of the choir is the transept, 34 ft. long, affording space for the organ as well as for large vestries. The south transept is not quite so long, but has an aisle on its east side opening out of it by a double arcade, and is also provided with a separate door. Here the school children will sit. The seats are low and open benches, the choir stalls being somewhat more ornate. The floors of the passages and chancel are all laid with red and black tiles, in patterns. There are wood floors under the pews. The heating apparatus is by Haden & Co., of Trowbridge. The windows are all fitted with thick granulated glass of a warm amber tint. The tracery of the windows has the lead-work arranged in various devices. The apse windows, made by Lavers & Barraud, are filled with glass, having a floral ornament. The capitals of the two pillars of the nave nearest to the east have been carved by Mr. Green, of Manchester, with the rose of Sharon and the lily of the valley. The gas-fittings have been supplied by Mr. Thomason, of Birmingham, and consist of wall-brackets. The west end of the church has three arches in the lower part, the central one containing a doorway; the others will, it is hoped, ere long be occupied by medallions and other decorations. Above these arches is a four-light traceried window, about 20 ft. high. There are nineteen clearstory windows, arranged in pairs of alternate design. The style of the church is Early Geometric Decorated. The tower and spire rise from the centre of the building to a height of about 150 ft. The belfry is octagonal in shape, and each side has a window, fitted with slate louvres. It is capable of containing a full peal of eight large bells. The spire is also octagonal, but an angle comes over the centre of each face of the octagon below. There are traceried windows in the south aisle. The architects are Messrs. Medland & Henry Taylor, of Manchester.

GLASS IN BLANK SASHES.

SIR,—During the past six months I have removed a large number of old wood sashes from freestone window frames, and substituted the best British plate-glass in lieu thereof. In the windows are a large proportion of "blanks." Some of these have been glazed with black enamelled glass and others with transparent glass, the plaster painted black behind it.

I shall be glad if any of your readers can inform me why these blank squares, both enamelled and transparent, are frequently "flying"? As it occurs only on the south side of the house, I can only attribute it to the great heat absorbed from the sun's rays. It is not caused by expansion of the heated air behind the glass, provision having been made for this by leaving small openings at the top edge of glass. The squares are all very carefully bedded, without wedges or pins, in elastic putty, made by mixing about half a pint of best olive oil with about 12 or 14 lb. of linseed oil putty. The transparent glass in the same windows, so bedded, never breaks. W. B.

THE NEED OF A NATIONAL ARMOURY.

AT a time when so much money is about to be expended on public buildings of a character not undeserving of the name Imperial, it may for a moment seem to be a step of questionable propriety to advocate the establishment of a new kind of public exhibition, that would demand either the large extension of existing, and even of projected edifices, or the erection of an entirely new structure.

But it must be borne in mind that occasions often occur, in the history of nations, no less than in that of individuals, which, once lost, never return. The lesson of the Sybilline books is one which no wise statesman can forget. Nor are we now so much entering into the purely architectural question of the erection of an armoury, worthy of the nation and of the age, as anxious to insist upon the importance of not allowing a present opportunity to escape. But, in seizing that opportunity, it will be puerile merely to grasp at the materials of a fine collection without at the same time resolving to make a consistent and worthy use of the acquisition. The question of the purchase of the Meyrick collection of arms involves the more important question of the establishment of a national armoury worthy of the name.

The purchase by the nation of the finest private collection of arms in Europe, and one of the finest in existence, is one entitled to receive the support of all advocates of artistic education. It is precisely one of those occasions which occur rarely, and which, when once neglected, still more rarely return.

But this purchase can be justified only upon the ground of its being made really available for educational purposes. It is not with the same object as that with which a country friend is taken to visit the famous chamber of horrors, that visitors should repair to a national armoury. It is as an illustration of the history of the last eight hundred years, the change in social habits, the advance in mechanical skill, the application of decorative embellishment to warlike defences, that such an addition to our Art Museum is valuable. For this purpose the Meyrick collection forms but a single chapter, although a splendid and voluminous one, in the illustrated history of armoury.

It will, no doubt, unavoidably happen, that in any series of illustrations of a long period of artistic labour, certain portions will afford fuller materials for the collector than he can hope to find for the remainder of his work. Of certain periods, and notably of the earliest periods, his specimens are likely to be few. But it is none the less true that to give the full value to these more richly illustrated portions, a general idea of the whole outline of the subject must be presented to the student. An admirably arranged display for example, of the armour of the time of the Tudor dynasty, giving such abundant specimens as shall show the general change of fashion that occurred, reign after reign, can only convey a distinctive lesson, either to the observer already acquainted with the general history of the weapons of offence and of defence, or to the special student of the events of the Tudor times.

But if a general collection be framed, showing by few, but well-selected examples, the utter transformation which the defensive array of the nobleman underwent, from the date of the Battle of Hastings to that of Marston Moor, the fuller details of that portion of the change which occurred between the Battle of Bosworth and the defeat of the Armada, will have a twofold significance.

For an armorial gallery, then, of which the Meyrick collection should form the fullest and most brilliant division, we must ransack other stores to obtain the requisite complementary information. In many instances it may be difficult to obtain actual arms. We shall be driven to have recourse to monuments, to ancient tapestry, to brass rubbings, even to illuminated missals and books of devotion. No period should be omitted from the historic series, however inadequate may be our present means of representing that period. In each we should distribute the best positive information at present within our reach. The mere fact of the existence of such a national collection, however bald and poor might be the outline which certain portions would in the first instance present, would be a great historic and artistic advantage. Contributions would flow in from all sides. New specimens would be collected by purchase, by gift, by exchange, by electro-type reproduction. Anomalous and ill understood weapons, or portions of armorial defence, would find their natural places as illustrative of one another, and the gallery, thus organised, would have a growth almost like that of Nature herself.

Nor should our investigation be confined to English armour, or to the armour of the period of chivalry. The general progress of human skill as applied to offensive and defensive weapons should not be left out of sight. We may trace the regular development, for example, of the resistless thunder-bolts of our present warlike array, from the misshapen stones with which the giants were said to have assailed Olympus, to the Armstrong shell, and to the Whitworth bolt. The progress of mankind in the use of missiles had been long and rapid before the invention of gunpowder. Two thousand nine hundred years ago the use of the sling in battle appears to have been a novelty. Within a quarter of a century from that date we find reference to a national, or, at all events, to a military, practice in the use of the bow. In Egypt we find that weapon represented from the times of the earlier dynasties. The projection of large stones from the balista, for purposes of battering, as well as for personal offence, was a marked feature of Roman warfare. The two methods of missile annoyance were long employed side by side, the powerful cross-bows, for which the Genoese were famous, being the last form of machine for the mechanical discharge of a bolt, while the cloth yard shafts which the English archers were taught to send, with such accurate aim, from their 6-ft. yew bows, made their trajectory on the principle of the rifled bullet of the present day; a rotatory motion being communicated to the arrow by a slight twist, or rather screw, in the insertion of the feather.

The relation between offence and defence is almost as close as the mechanical relation between action and reaction. A new missile, or a new weapon, rendered useless an old form of defence, or rendered advantageous a new one. An improvement in mail, suggested the employment of a new offensive weapon; such, for instance, as the long narrow pick designed for penetrating the joints of the armour, or the apertures in the visor, which one of the Meyrick horsemen holds in his hand. The same controversy that now rages between increasingly heavy ordnance, and increasingly solid armature, for ships or for forts, has been constantly brought to the arbitrement of the open field. The progress is distinctly intelligible. It has continually been that of the gradual perfection, or at all events increase in solidity and in weight, of the defensive panoply. Parallel with that increase has been the increase in the violence of the attack. So long as manual encounters decided the fate of battle, this increased force in the shock was partly due to that very increase in the weight of armour that was intended for resistance. The impact of the lance in the lists became so tremendous, towards the time when the accidental slaughter of King Henry II. of France gave the first grand discouragement to the practice of the tourney, that tilting armour was made of a solidity, and a peculiar one-sided form, altogether inappropriate for actual warfare. The pauldron that was forged to receive the blow of those ponderous lances, that always look so impossible in pictorial representations, weighted the left side of the corslet in a manner inconsistent with the activity of the *mêlée*; and the unprotected freedom left to the right arm, in suits of armour of this description, would have been equally disastrous in any combat not regulated by strict chivalrous rules.

The earliest European armour with which we are acquainted—that of the Roman soldier—was made of boiled leather. It took, in many instances, the form and the muscular markings of the body, being a simple, solid, hard tunic, with a square hole, protected by metal straps, through which the head was thrust. Recent discoveries at Pompeii have disentombed the Roman soldier from his repose. He died on his post, and the thickly drifting volcanic ashes closed around his form, and his arms, with the accuracy of a plaster mould. Thus the minutest detail of his array, even to the ligaments of his sandals, has been accurately preserved by the fatal tufa, which formed around him almost before life was extinct; and what appeared to be mere conventional representation, on ancient bas-relief, or coin, or statue, has now become distinctly intelligible.

The leathern tunic was first adorned and strengthened by straps, or plates of metal. Then parallel plates or scales were attached. By degrees these metal joints were framed so as to depend more on each other than on the leathern sub-structure. Rings were substituted for plates or scales. The old tunic was replaced by the softer material of wash-leather, and the coat of mail became entirely distinct from the buff jerkin worn beneath it.

At the period of the Norman Conquest, when what may be called the armour of feudalism or of chivalry first becomes familiar to our knowledge, the use of mail had grown very prevalent. Mail shirts, greaves, shoes, gauntlets, hoods, appear on the Bayeux tapestry. A solid steel cap, at one period, seems to have been the only portion of the defence that was made of plate; and a mail hood was thrown over the steel cap. Play was given to the neck by a mail shirt or gorget, long after plate had spread over the rest of the person. This mail appears in distinct small pieces, to protect the arms, the elbows, the breast, the thighs; and then gradually displaces, or rather replaces, the mail fittings, until the whole figure is seen to be clad in one solid riveted panoply of plate-iron. The gradual disappearance of mail in certain parts of the figure dates the period of armour with considerable accuracy; the last improvement being that of the protection of the throat by overlapping plate-joints, and the total disappearance of mail.

What ultimate revolution might have occurred in the armature of the noble, it is now impossible to guess. The armour at the Tower of London, badly looked after as that collection has been, here offers a mute, but most instructive lesson. We have a long period in English history, during which no armed sovereign of our island took the field. Thus the armour made for Edward VI. closes the series of royal panoplies. Elizabeth Tudor bore the heart of a king to the inspection of her troops at Tilbury, but not the iron clothing to which kings had long been accustomed to trust. With her unwarlike successor the heavy weight of the plate panoply was thrown aside as useless. For the armour of the tilting field would not resist the bullet projected by gunpowder. The weapon of Guy Faux was more irresistible than that of the Comte de Montgommeri.

Connected with this general transformation from the Norman mail to the plate of the Valois and the Tudor reigns, was a change in one portion of the defensive armour so gradual and so steady, that it might be reduced to definite metrical rule. An accurate study of a well-grouped series of armour would bring out very prominently the gradual diminution of the shield. We know that in Sparta the true military instinct of a people who were not only quarrelsome, but warlike, placed the point of military honour in the preservation of the shield. With mail armour was associated the use of a large, long shield, capable of protecting the person from head to foot from the flight of arrows. As plate superseded mail the size of the shield diminished, partly to save the weight which was added to the immovable parts of the defensive array, partly because the plate would resist the arrow which might penetrate the mail. Thus reign after reign, with the increase of the plated portions of the armour, the shield lost inch after inch of its size. At length it remained merely as the target intended to catch the blow of the tilting spear; and the curious form assumed by the heavy pauldrons leads to the speculation that, even had gunpowder not been invented, the shield might have ultimately disappeared. A scale of antiquity might be constructed from an accurate measurement of the successive forms and sizes of the shield. This subject assumes extreme interest in connexion with the authenticity and the date of monuments. In regarding questions of anachronism in this respect we should bear in mind that a genuine monument may represent costume later than that worn by the person represented on the effigy; but earlier, never.

While the steady change of fashion which has taken place in the form of defensive armour, whether we regard the protection of the trunk and limbs, the helmet, or the shield, has thus followed a certain intelligible course, every freak of the most fantastic imagination seems to have been embodied in some quaint shape of offensive weapon. Halberds and hooks, and picks and maces; swords, from the ponderous 6-ft. blade to the lady's stiletto; engines for discharging projectiles, which took in time the generic name of artillery, are represented by so many specimens as almost to resemble the creations of night-mare. The diabolical ingenuity attributed to the mysterious "Companion of Sintram," has been emulated by the armour smiths of the Tudor times. There is hardly one of the impossibly grotesque armed figures of the "Contes drolatiques," who might not have equipped himself at Goodrich Court. The different aspect

of a line of battle in which the soldiers are armed with regulation weapons, whether lance, or rifle, or bayonetted carbine, and of one in which each weapon suited the skill or the fancy of its possessor, must have been as wide as that between the fish of the old red sandstone and those of our present waters.

It is unworthy of our national dignity that we should be without a fit museum for the display and the preservation of these curious relics of the past. The citizen of Madrid, of Vienna, of St. Petersburg, even of gallant little Turin, would shrug his shoulders at the reply elicited by the question, which was our historic armoury?

We have, indeed, in the Tower of London a collection of arms which, if added to those now at South Kensington, and properly arranged, would form the basis for a very noble museum. The removal of artistic or archæological objects from their local places of deposit, is not always a desirable proceeding. The axe, and the block, of fatal memory, now exhibited in the Tower, would lose their associations of terror if put under a glass case at Bloomsbury or at Kensington. But it is otherwise with the suits of armour. They are at the Tower accidentally. An ancient place of strength has been converted, in failure of its old military and political importance, into a depôt of arms. Among these weapons have been kept some that have gone out of use. There can be no good reason against removing such of these as possess historic value from an inaccessible place, in no way adapted for their proper preservation or exhibition, to a well-ordered national armoury. With them should be associated, in honourable safe-keeping and tendance, such famous relics of some of the noblest of our historic chieftains as now ignobly moulder in neglected solitude. The helmet of the Black Prince, shorn of its Bohemian plume, gathers dust, and is gradually devoured by rust in Canterbury Cathedral. That of Harry V., the terror of France, lurks (or lurked) in similar disregard in Westminster Abbey. Our deans and chapters have not made it a part of their duty to tend reverently either the effigies of the great or the relics of the mighty.

Feudal armoury thus historically treated, would be well illustrated by specimens of the weapons, and of the defences, of other nations. In social phenomena, as in natural history, an acquaintance with widely-lying districts illustrates the succession of the most advanced condition of life. The British Museum could contribute specimens of savage clubs, and tomahawks, and poisoned arrows. South Kensington could contribute rich and curious Oriental arms. By bringing all our stores, from the flint knife or the bone arrow-head, of the times when our ancestors had to struggle with the cave bear and the woolly-haired rhinoceros, down to the small explosive shell which a semi-barbaric power has suddenly discovered to be inhumane, into one focus, we shall add a most instructive and intelligible chapter, not only to the records of modern Europe, but to the physical history of mankind.

The idea has been suggested by some of those who are in the best position for forming an opinion on the subject, that the national armoury should form, not a mere portion of the museum of art, but a separate and independent institution. In that case it has been further suggested, there would be good reasons for building the edifice necessary for the reception and exhibition of the arms, in the vicinity of the Tower of London. That densely populated part of London is far removed from any museum or educational exhibition. There would thus be a local benefit conferred on a large district of the metropolis; while at the same time those historic associations, which the architect ever studies to maintain in active vigour, would be acknowledged and to some extent revived. The subject is one deserving careful attention. It is a detail, but an essential detail. The first thing to be regarded is, the removal of the national reproach that rests upon us in the matter. We have a history of which any people may be justly proud; but while even so small a state as Savoy was before it became merged in an Italian kingdom, had an armorial gallery of a description to which we could lay no claim, our only public armoury exists *per accidens*. Nor is it matter of decent self-respect alone. The knowledge of the actual history of defensive armour is essential to the education of the historian, the archæologist, the sculptor, the painter, and the decorator. It is a subject on which no good architect, either, can afford to be ignorant.

EDUCATE; BUT RIGHTLY.

IF we consider that of all the various subjects which at different times have occupied the minds of men, there is, perhaps, none which possesses a wider interest, a more universal importance, than education—none that has a more immediate and direct bearing, or is capable of exerting a more powerful influence, upon the moral and physical welfare of society at large—we shall not be surprised at the large share of public attention it still continues to attract, though so much has already been said and written about it from almost every possible point of view.

Various and conflicting have been the opinions enunciated, some of them obstinately defended and pertinaciously maintained, more especially those relating to religious, as against secular, instruction; but upon one part of the question the concord of opinions has been wonderfully unanimous, viz., the necessity of raising the standard of education, and of extending its benefits to all classes of the community. Yet this question, like every other, has two sides to it; and it is a point of policy, no less than a maxim of justice, to hear both of them: a course which would seem, in the present instance, in some danger of being lost sight of.

Into the religious part of the subject it is not proposed to enter here; our present business being merely with that portion of it which appertains to secular instruction, and especially with the inquiry in what direction is education to be extended?

There is no doubt that elementary education should be universal,—that every man, woman, and child in the kingdom should be taught reading, writing, and some knowledge of arithmetic and of common things. And not less emphatically I contend that means should be afforded to all who have to earn a living, to acquire a special technical knowledge of the subjects required for the calling, profession, or occupation which they may intend to embrace.

In speaking of the sort of education, termed here, simply from its principal characteristic, "classical," it is intended to refer to that kind which for centuries has been, and to this day still is, imparted at most of our public schools, and continued at our two chief universities, and which consists mainly of the dead languages, with more or less of mathematics, and, quite recently, a very small modicum of natural science; but the encouragement given to this study is so small and inadequate, that it is evidently considered of no importance as compared with that of the classics.

It is proposed here to consider this kind of education from a more general and less partial point of view than that of the schoolmaster, who naturally thinks there is nothing like Latin and Greek, just as the cobbler thought there was "nothing like leather;" and so considered, it will be found, I think, with comparatively few exceptions, so negative in its effects, so barren of useful or practical results, so unproductive of anything but disappointment to thousands of those who have made the greatest sacrifices of time and money to acquire it, that it is a question whether its use should not be confined within much narrower limits than it has hitherto been.

The object which we all more or less directly seek in life I take to be success—such success as leads to fame or fortune, or both. Now, let us examine to what extent this is likely to be furthered by the possession of a thorough classical and mathematical education. If in any considerable degree such an education were essential to the attainment of this object, should we not naturally expect to find that the most highly accomplished men would be those who draw the greatest prizes in life? Should we not have a right to suppose that university men in general, and especially the most erudite of them, would almost invariably succeed in attaining the very highest positions in their respective careers, and that, at all events in such as demand a high intellectual capacity, men who have not enjoyed the same advantages, would be totally unable to compete with them?

But is this the case? With the single exception of the Church, the natural and faithful ally of the University, is there any one calling in which success is to any appreciable extent dependent upon, or in any calculable ratio proportioned to, classical knowledge?

Let us first consider those careers, for eminence in which the very highest rewards of the State are usually reserved. Are our most skilful diplomatists, our most successful generals, our greatest admirals invariably classical scholars or first-rate mathematicians? Or if we look elsewhere, shall we not find numerous instances of men who have become eminent in physic, in the law—who have even attained to the woolsack—without being university men or classical scholars? Are there not many who have even risen to the highest distinction in the senate, and have left their mark in the history of their country, with no aid from Latin or from Greek? Look next at those who have achieved success in the pursuits of commerce, of finance, and of speculation—at our merchant princes, our wealthy bankers, our city magnates, our millionaire contractors! Are *they* usually remarkable for classical knowledge? If we turn even to the regions of science—the peculiar province, as one might imagine, of the schools—and look at the grand modern discoveries in chemistry, in electricity, in light, optics, physics, and mechanics—

> "In the railway, in the steamship, in the thoughts that shake mankind,"—

what shall we find that the Universities have done for us there? Is it to them that we owe those magnificent inventions and improvements which have wrought more wondrous transformations than the wave of wizard's wand, annihilating Time and Space, and leading Matter bound, like a captive of old, to the triumphal car of Mind? No! their systems did not produce, nor their teachings foster, the Franklins, the Davys, the Watts, the Stephensons, the Fultons, the Faradays, the Wheatstones—those great thinkers and workers who are the boast and glory of these recent ages and the benefactors of all succeeding ones.

Let us turn lastly to literature; *there* surely, if anywhere, one might expect to find the triumph of scholarship assured, and its influence invincible. But is it so? As for the poet, he must be born, we are told, not made; which is at once a confession that for him, at all events, classical learning, and indeed book-learning in general, is by no means indispensable. And accordingly, although the universities have from their very foundation fostered and encouraged the study of the ancient poets, how small a proportion, among all the thousands who have spent years within their precincts in poring over the masterpieces of Homer, Virgil, and Horace, have produced poems which can compare with the works of those who, like Shakspeare, Burns, Hogg, and Keats, drew their inspiration not from books, but from Nature!

Nor, if we come to reflect upon the matter, will this result appear surprising or unexpected. The very essence of the true poet is originality; the most polished diction, the most elegant turns of expression, the nicest skill in the management of rhythm and rhyme can never atone for hackneyed ideas and borrowed thoughts. Now, can originality be taught in the schools, or acquired by study? Is it not actually more difficult for the man who is steeped to the soul in the thoughts of others to be original, than for him who has only communed with nature, and who has thought only his own thoughts, not those of other people? Are we not more likely to tread in the footmarks of others if we travel a road which has been frequented for ages, than if we wander without a guide in the primeval forest, or over the trackless prairie? Will not the student of books be perpetually finding that the ancients have "stolen all his best thoughts" from him? While if once in a way an idea should occur to the unlettered poet which has already been used, it will be but a chance similarity, not a direct plagiarism; and at the worst it will be, in all probability, seen from a new point of view, and clothed in fresh colours.

And what has been said of the poet is almost equally applicable to writers in other branches of literature. Are not some of our very best modern works of prose fiction written by women, who certainly are not graduates of any university, and are for the most part entirely ignorant of the languages and the literature of the ancients?

Were it worth while to pursue the inquiry, I believe we should still arrive at the same results, and find that there is scarcely any branch of literature in which the greatest names will be found the highest on the list of Classics or Wranglers of the universities.

It is not necessary now to seek to account for these facts, or to ascertain why it is not among the most profound scholars that we must look for the most brilliant conversationalists, the most able writers, the greatest discoverers; why those who possess to a high degree the faculty of

acquiring knowledge, are, in so many instances, extremely deficient in that of imparting it to the world; but certain it is that very generally those who have most profoundly studied and most thoroughly mastered a subject, are less successful in teaching it than some who are less perfectly versed in it, yet have in a greater degree the gift of enabling others to understand it. It may be either that these faculties are by nature diverse and almost antagonistic, and therefore rarely combined in the same individual; or it may simply be that the undue encouragement and constant exercise of the one dwarfs the growth, and ultimately saps the very existence of the other. Probably it is with the mind as with the body, that an inordinate appetite by no means implies a good digestion, and that the habit of taking in food with great rapidity and in large quantities, prevents its assimilation, without which the food does no good, but, on the contrary, considerable mischief.

However this may be, it is certainly the case that it is one thing to absorb knowledge, and another to give it out; so that the lives of the most profound scholars have, more frequently than otherwise, been completely barren of useful results. They have locked up within their own brains the enormous stores of learning they have spent a lifetime in hoarding, and—worse even than other misers—have carried their treasures with them to the grave, instead of leaving them behind for the benefit of their immediate heirs and the enrichment of all future generations. Examples innumerable might be accumulated in proof of these assertions; but the names of Porson and Mezzofanti must be familiar to every one as instances of the most extraordinary acquirements and the most insignificant results.

But if we take a more extended horizon and a lower range, we shall perceive still more clearly the defects of the present system of considering a classical education the best possible preparation for nearly every one of the various pursuits of life. Let us look at the results in a few instances.

A young man of my acquaintance, who has lately taken his B.A. degree, is an excellent Latin scholar and a very fair Grecian; yet he cannot hold a conversation in French, or write a Spanish letter for his father, the merchant. Another is well up in mathematics; he has the integral and the differential calculus at his fingers' ends, but it is ten to one he cannot calculate a sum in compound interest half as quickly as the junior clerk in his uncle's bank, whose entire schooling was comprised in four years at a cheap commercial academy in Peckham. A third actually knows something of Hebrew; yet the Civil Service examiners would not pass him for a junior clerkship in the Customs or the Post-office, because his English composition was slovenly, and his handwriting barely legible.

What, then, shall the young graduate do with his classical knowledge? To what market shall he carry his Homer and Horace, his Todhunter and Newton? Of course he may get a fellowship or a college living, or even, if his luck be good and his connexions high, a bishopric; but these prizes are necessarily for the few;—and what of the many? What will society give *them* for their Greek and mathematics? Why, a curacy in Wales with 80*l.* a year, or an usherships at a school with 60*l.*

When a lad, then, is not born to independence, but has to earn his living in a lawyer's or merchant's office, in the army or navy, the civil service, or any other of the ordinary occupations and professions, is it, I ask, absolutely indispensable—nay, is it even desirable—that he should devote several years of his life to the acquisition of the dead languages? Does it not warp his ideas from a more practical and profitable channel, and waste precious time that might be employed in mastering such special branches of knowledge as would fit him not merely to pursue creditably, but to excel and rise in, his future career? If a lad is to become a merchant, why not rather teach him modern languages and book-keeping? If a sailor, let him study navigation and steam; if a farmer, agricultural chemistry. If he is to be an architect or builder, would it not be better for him to employ his time in acquiring the art of construction than in learning the Greek particles? Would not Tredgold's "Carpentry" be a more useful text-book for him than Ovid's Metamorphoses? If he is to earn his living as a telegraph clerk, should he not study telegraphy rather than Terence? Will Conic Sections make a clever contractor, or the writings of Euripides an engineer? Is the Binomial Theorem essential to a barrister, or Surds to a solicitor?

Some will reply that these studies are intended merely as the groundwork of a complete education—as the best substructure for technical instruction. But the length of time employed in them at once disposes of this objection; for in this busy, hand-to-mouth age, when time is money, and the struggle for existence is daily becoming fiercer and more desperate, we cannot afford to spend a third of our probable span of life in merely laying the foundation of education. No; when a youth passes from Eton or Westminster, Merchant Taylors' or Charterhouse, to the university, and comes away at the age of 22 or 23, he is practically presumed to be fit to make his way in the world in any capacity whatever. It is clear, therefore, that the studies which are commenced at a public school, and continued at the university, are intended as the sum total—the be-all and end-all of education; and it is, I think, equally clear that in this sense they are wofully insufficient, and lamentably unserviceable, at least for nine out of ten of the various walks of life; and I would therefore ask whether a considerable portion of them might not with advantage be remitted in favour of other branches of knowledge which would exert a more direct and practical influence upon the active pursuits and real business of after-life.

Of course, it is not always true that "the real worth of anything is just as much as it will bring;" and no doubt learning has uses and advantages which cannot be precisely measured by the metre of £. s. d. Perhaps the most plausible mode of defending a classical training is that of considering it as synonymous and identical with the cultivation of the intellect; as if there were no other means possible of effecting that object, or, at least, none other worthy of consideration. But no satisfactory reason is ever vouchsafed why the dead languages should tend, more than natural science or any other branch of knowledge, to promote *thought*, which, after all, is a far higher exercise of the intellect than the more mechanical one of memory, which alone is necessary for the acquirement of languages. Nor, on the other hand, can facts be more successfully appealed to in support of the assumption; since, as we have already seen, the chief positions in diplomacy, finance, literature, science, and all those careers which require the very highest intellectual qualifications, are occupied by men devoid of classical training, *at the very least* as frequently as by those who have most enjoyed its advantages.

L.

TREE WORSHIP AND CONIFEROUS TREES.

IT is very difficult to draw the line between the actual worship and the mere reverence of trees and plants. Incredible and romantic tales innumerable might be cited, similar to the legend attached to the Roman Arum (*Dracunculus communis*) referred to in last week's *Builder*. If some competent person would publish a catalogue of all plants that have been, or are, worshipped as gods, or that have sacred legends attached to them, it would prove a most instructive piece of work.

That trees were ever worshipped in consideration of their value to man, as suggested by Mr. Fergusson in his recent lecture, reported in your columns, or on account of their long life or imposing aspect, is quite fallacious; for amongst sacred plants we have objects the most worthless, insignificant, and short-lived. Mr. Fergusson also tells us that very few traces of tree worship are left in this country, and these traces are on the borders of Wales; but he omits altogether to say what the traces are, and what *trees* he refers to. Traces of tree-worship pure and simple may be very few, or they may be many, according to the views of the writer on the subject; traces of the reverence of trees as possessing sacred, occult, or mystical properties are common enough,—witness the singular beliefs regarding the mountain ash and the poplar. The foliage of the latter tree exactly resembles in shape the heart-like foliage of the sacred fig of the East (*Ficus religiosa*) and other hallowed plants: the poplar itself is even said, on good authority, to be worshipped by certain savages at the present day; and in this country we have the curious legend that the Cross of Christ was made from its wood.

But omitting for the present all reference to other trees but the fir tribe, the beliefs and legends connected with the *Coniferæ*, or cone-bearing trees, are most remarkable. In ancient writings, it is difficult always to precisely determine the special trees referred to, but under the term *Coniferæ* are understood the fir, cedar, yew, &c. The references to the cedar in the Bible, to the groves of "sacred pines" in Ovid, the representations of fir-cones in the hands of the mystic figures on either side of the sacred trees in the Assyrian sculptures, the pine splints used in torches during sacred ceremonies, cedar ashes used as a purification from sin, the fir-cone fixed on the staff or thyrsus of Bacchus, and the fir-chaplets of the Isthmian games, are pretty familiar to us all. That conifers were worshipped for their value to man, that the cones were significant of "fire," as suggested by Layard, or were merely used to flavour the wine of Bacchus, are thoughts quite unworthy of the subject; the real origin of the sacred attributes of trees has yet to be written.

Through the middle ages we find the *Coniferæ* regarded with the same reverence; pilgrimages were made to the ancient cedar-groves, with feasting, singing, dancing, and the celebration of religious rites. How far these notions have varied and been brought down to the present day it is not easy to say, but in ancient sculptures we find representations of these sacred trees, adorned with ribbons, medallions, statuettes, and nick-nacks, apparently as offerings to the gods on special occasions, just as in this nineteenth century at the greatest festival of the year we have one of the coniferous trees brought into our houses, illuminated and garnished with the same ribbons, medallions, toys, and nick-nacks, apparently in honour of the birth of Christ. Is it too much to say that the Christmas tree of northern nations is a mere relic of Pagan tree worship (so called), or is it only a curious and meaningless coincidence? Any reference to the veneration of the sacred bean (*Nelumbium*), the sacred fig (*Ficus*), the sacred cotton (*Gossypium*), the meaning of the sacred tree of the Assyrians, the thyrsus of Bacchus, trees held sacred by savages, sacred water-plants, the remarkable and well-known fungus (*Polyporus sacer*), worshipped as a god in West Africa, the plants grown upon roofs and eaves of houses as the houseleek (*Sempervivum*) in the most ancient times, and at the present day, to repel evil spirits and avert lightning, would prove too long for the present number of the *Builder*.

W. G. S.

THE FALL OF ROADWAY, GREAT EASTERN RAILWAY.

ON the 19th, Mr. Humphreys resumed the inquiry respecting the death of the four men who lost their lives through the fall of arches at the goods station of the Great Eastern Railway. Various witnesses said they had seen a crack in the stone early in February. Mr. Charles Provis, engineering agent in the employ of Messrs. Lucas, said three weeks before the accident his attention was called to the crack, and he had it filled with cement. He afterwards directed the girders to be shored. There was no other way to set things right but by putting up struts and removing the pillar and the stone. Mr. J. Tinkham, inspector of works to the Great Eastern Railway Company, said he had seen the stone since the accident. The bottom of it was hollow. The cause of the cracks in the stone was due to that. It could have been ascertained that the stone was hollow before it was placed in position.

Mr. James Edmeston, architect, produced a written report of an examination which he had made. He attributed the accident to the cracks in the stone. There was a hollow underneath the stone, in the stone itself. The weight which the iron pillar supported was 200 tons. The stone was from Bromley Moor, near Leeds, and was of a kind extensively used, and considered good.

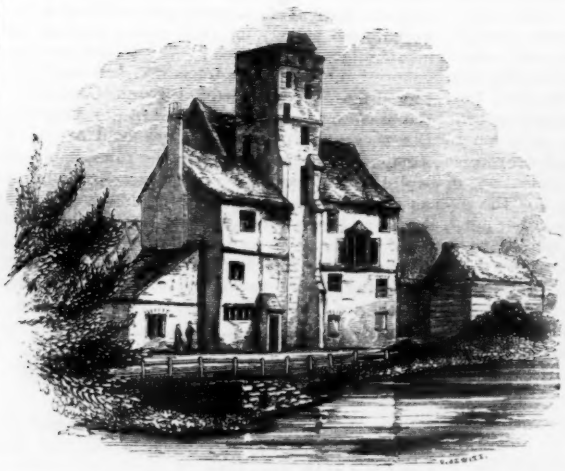
The jury, after a long consultation in private, returned a verdict:—"That the deceased persons were killed accidentally by the falling in of a certain roadway, which was supported by an iron pillar, which rested on a hollow stone, and that fissures in the said stone caused the fall; and the jurors say that when the said fissures were first noticed the girders should have been shored up and a perfect stone substituted for the imperfect one."

Society of Engineers.—At the ordinary meeting of the Society of Engineers, held on the 15th instant, Mr. F. W. Bryant, president, in the chair, a paper was read "On Joints for the Prevention of Leakage in Gas and Water Mains," by Mr. C. M. Barker.

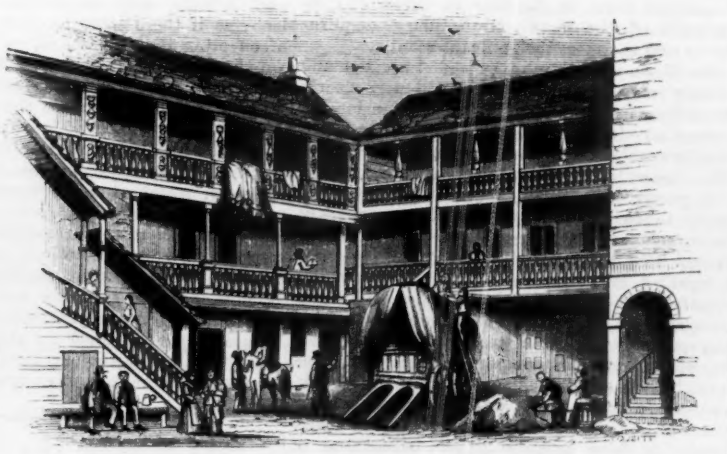
ISLINGTON OF OLD.

The Old Church.

Old Queen's Head.



Canonbury Tower.



Old Angel Inn.

[See pp. 217 and 218, *ante*.

THE SITE FOR THE LAW COURTS.

EVIDENCE and opinion accumulate in favour of retaining the site already obtained. Mr. F. W. Sheilds, C.E., in a report to the Chancellor of the Exchequer, just now printed by order of the House of Commons, arrives at the opinion we have already expressed, viz., that the Strand and Carey-street site has the advantage of the Embankment site in important particulars.

"Its adoption," the reporter says, "as appears from the estimates of Mr. Ryde, would save a further expenditure of 725,000*l.* of public money. Its level is better suited for external access. Its position is much more central and convenient, being midway between the Temple and Lincoln's-inn, and also midway between the great thoroughfares of Holborn and the Strand. Its great defect, which turns the balance against it, is the want of a leading thoroughfare on its northern or Holborn side. It appears to me, therefore, that if this deficiency were provided for, the Carey-street site would be the more advantageous both for the legal profession and for the public."

His plan for effecting this object is to carry a wide street, in continuation of Piccadilly and Long Acre, through Carey-street to Cheapside. This new street would be continued from Long Acre by Covent Garden and Drury-lane theatres, to pass along the northern front of the Carey-street site, and thence it would be extended (crossing the Farringdon-street valley by a viaduct) to the end of Cheapside at St. Paul's. It is proposed also to widen the passage called "The Turnstile," at the eastern end of Lincoln's-inn-fields, so as to give a direct communication for carriage traffic between the Law Courts and Holborn.

To meet part of the cost of the new street, Mr. Shields proposes that a company should be authorized to make an underground railway from the junction of the Fulham and Cromwell roads, near the South Kensington Museum, to the Mansion House, terminating in the new street now in course of construction from that point to Blackfriars Bridge. The tunnel could be formed without interference with private property; and the company, having no property to purchase and no compensations to pay, would be able to contribute a considerable sum towards the new street in return for the privilege. The remainder of the cost, he suggests, ought to be shared between the Government and the metropolis.

ST. PAUL'S CHURCH, ST. LEONARDS-ON-SEA.

THE church, of which we here give a view, has been recently built at St. Leonards-on-Sea, adjoining Hastings, at the sole cost of the late Mr. William Gilliat, of East Hoathley, Sussex, from the designs of Mr. John Newton, of Salisbury-street, London. It has a commanding situation over the entrance to the Hastings tunnel, on the hill immediately above Warrior-square, and will have cost, when the spire is finished, about 16,000*l.* The contractors were Messrs. Jackson & Shaw, of Westminster, and Mr. George Walters was clerk of works.

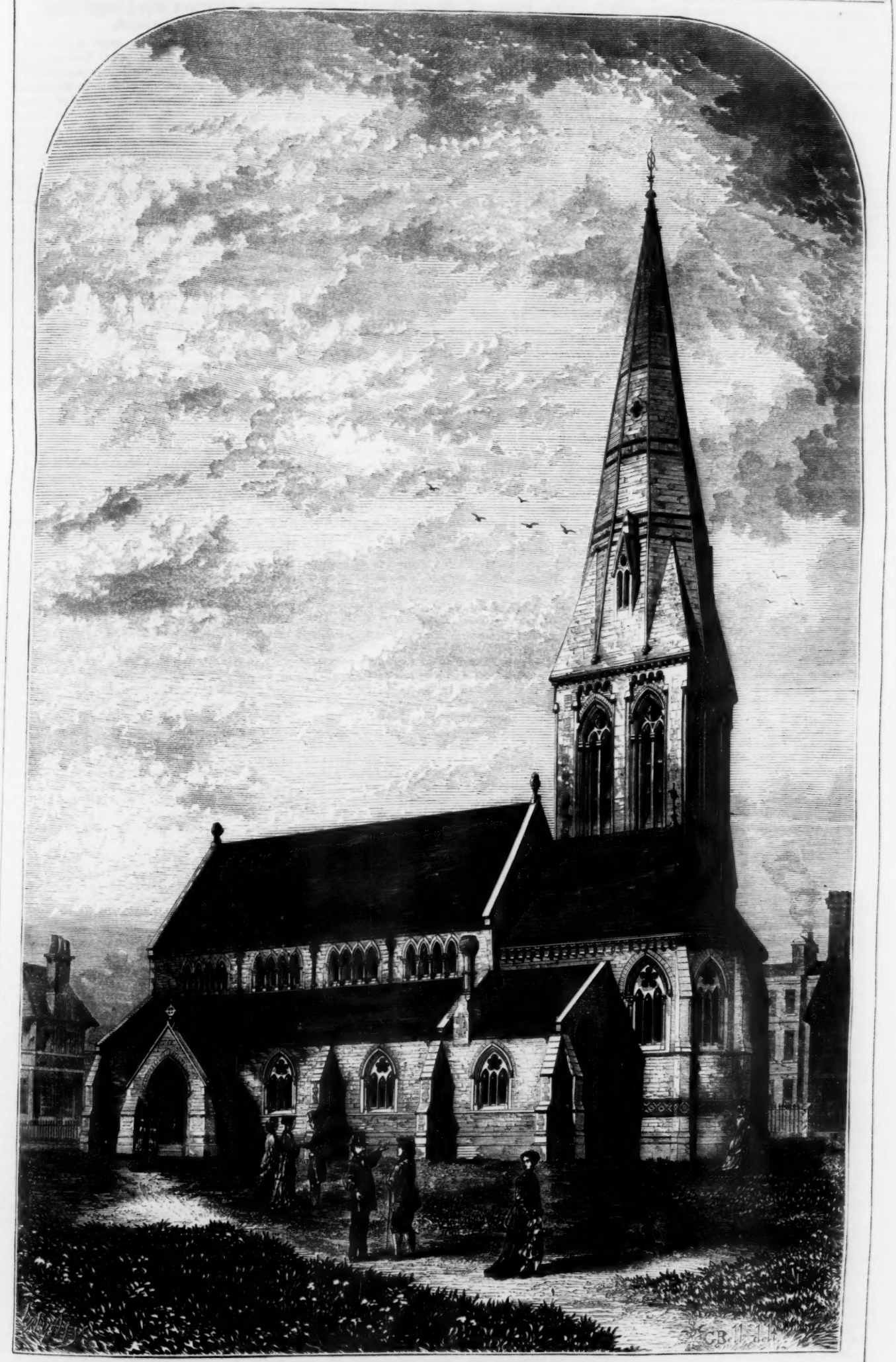
The church, which will accommodate about 700 persons, is built of Local Blue stone, with Bath stone dressings, and is lined internally with Fareham bricks, tiles, and Bath stone bands. It consists, on plan, of nave and two side aisles, with north and south porches. The chancel terminates in a horse-shoe apse. South of the chancel is an aisle, and on the north the tower, containing a fine organ by Holdich. It was originally intended to place the tower on the south side, but the difficulties of foundation rendered an alteration desirable.

There are five arches on either side of the nave, supported by shafts, and clustered responds of Devonshire and Greek green marble. The clearstory consists of a succession of narrow lights surmounted by a roof of good proportions, covered with Broseley tiles. The chancel is groined, as also the apse, with incised stone and brick.

The pulpit and reredos are of Alabaster, the font is of Sienna marble, and the sedilia of Caen stone, all inlaid with panels of marble. Messrs. Field & Co. supplied the marble, and Messrs. Farmer & Brindley executed the carving.

Messrs. Minton & Co. executed the tiles for the pavement, which is elaborate, having subjects incised in marble. The working cartoons for these, as also those for the incised subject of the Lord's supper, in the reredos, were made by Messrs. Burlison & Grylls.

Messrs. Clayton & Bell executed the stained glass windows; Mr. Robinson, of Holborn, the stalls; and Mr. Leaver, the gas standards.



ST. PAUL'S CHURCH, ST. LEONARDS-ON-SEA, SUSSEX.——MR. JOHN NEWTON, ARCHITECT.

THE "SEPARATE SYSTEM" OF DRAINAGE.

SIR,—Now that the natural streams and rivers in and near to towns are seen to be polluted, and their beds to be silting up, through being used as outfalls for sewage; and that large sewers, by receiving sewage as well as rainfall, cause filth to deposit and noxious gases to generate within them, which gases escape into and contaminate the atmosphere, people begin to perceive that a great mistake has been made in draining the metropolis and towns throughout the country by this "combined system." It is now, therefore, very evident that what is aptly termed the "separate system" should have been adopted instead of it, so far as circumstances would have permitted. The "separate system" consists in collecting the *natural* or subsoil and surface drainage of towns into channels separate from the *artificial*, or house and soil drainage, and discharging it into the natural streams and rivers, and in receiving the artificial drainage into channels separate from the natural drainage, and carrying it to convenient places for profitable distribution on the land. The growth of the "combined system" has been altogether accidental. It arose out of the necessity to rid ourselves of the foul drainage of our houses; and, without thinking or troubling ourselves about the error or mischief we might be doing, we must, forsooth, turn it into the nearest watercourse; or, if that was not at hand, we must carry a sewer or a drain up from it for that purpose. In this way the "combined system" came gradually into operation, without pre-arrangement of plan or principle, until it grew into the system as we see it developed in the works of the Metropolitan Board, and also, taking their cue from it, of the Local Boards throughout the country; and the inevitable result is the continual pollution, by the foul liquid, of every natural stream and river on the one hand, and by the noxious gases engendered of the atmosphere on the other. This great error in the drainage of towns cannot be gainsaid. It is palpable, not only in the foul state of the streams and rivers and the atmosphere, but in the high death-rate returns of the Registrar-General. Had the "separate system" been adopted twenty years ago, when it was first promulgated, it is fair to presume that the people living in towns would now be breathing a purer atmosphere, and that the death-rates would be much less than they are. It is not complimentary to the sagacity of those to whom the serious question of the drainage of the metropolis was referred at the time that they should have utterly ignored this system without due and calm inquiry into its merits. No doubt they acted according to their light, and that is all that can be said in mitigation of the monstrous evil that has been perpetuated in the drainage of towns. The "separate system," however, is beginning to be understood, and is gradually coming into action, as doubtless it is the proper principle to be adopted; and not only the present, but all future works of drainage should be made to conform to it as much as circumstances will permit. The following is an abridgement of the preliminary report of Mr. John Phillips on the drainage of the metropolis, July, 1849, wherein the "separate system" is advocated. Mr. Phillips, who was chief surveyor to the Metropolitan Commission of Sewers at the time, was led to recommend this principle for adoption from his thorough acquaintance with the working of the sewers under his care, and it is to be deplored that it was not then put into practice. The metropolitan sewers are nearly as bad now in regard to cleansing and ventilation as they were twenty years ago, when they were examined, and remedies were proposed embodying the "separate system." This yet remains to be done. The main drainage that has been carried out has in no way improved the general ramification of the sewers in these respects, but simply removed the foul condition of the river from one place to another.

"It is impossible to provide a perfectly innocuous system of town drainage while combining in one channel the house and surface drainage. They must be kept separate. Sewers which receive both kinds of drainage accumulate soil, and generate noxious gases, which escape into the houses and streets. The necessity for flushing to remove the soil, and for trapping to prevent the smell from escaping, proves that the combined system is eminently at fault. A general trapping would not remedy the evil, since foul air would be generated as freely, and would pass up the drains into the houses instead of into the streets. The evil arising from house drains discharging into sewers which receive surface drainage, is not confined to the houses and streets, for such sewers constantly pour floods of filth into the river, which is polluted in consequence. It is impossible, therefore, to preserve the purity of the air we breathe, and of the river, on the banks of which we live, while the filth from the houses is allowed to pass into the sewers which communicate with the surface and empty into the river; and, therefore, it is a necessary condition of perfect drainage that separate channels should be provided for the house drainage having no connexion with the river.

In order to restore the atmosphere of the metropolis, and also the natural watercourses and the river, to their original purity, the following principles must be conformed to:—

1st. That two systems of sewers and outfalls, independently of each other, should be provided; one for the discharge of *natural* or surface drainage, and the other for the discharge of *artificial* or house drainage.

2nd. That as outfalls are already provided for *natural* drainage, it is only necessary to provide separate outfalls for *artificial* drainage, which should be conveyed to convenient depôts below the town.

3rd. That, in order to perfectly drain the subsoil and the surface, a system of *permeable* sewers should be provided to discharge into the natural watercourses and the river.

4th. That, in order to carry off the house drainage, without the escape of effluvia, a system of *impermeable* sewers should be provided separate from the *permeable* sewers, to discharge without intermission into artificial outfalls, independently of the river.

5th. That on these outfalls depôts should be formed and works established for raising the sewage and distributing it for agricultural purposes.

As the river is the natural outfall for the drainage of the subsoil and the surface, it is proposed to lay down permeable sewers where none now exist, and to lower and improve those sewers which are inefficient. One of the evils of the combined system is that the sewers in the low districts are filled part of each tide with the drainage which comes chiefly from the high districts. By intercepting the island waters and conveying them into the streams and river, above the influence of the tide, this defect would be remedied, and the sewers in the low districts would be sufficient to accommodate the quantity of water falling thereon. In these arrangements the present sewers would be deepened and made efficient, and lines of catch-sewers would be constructed to serve as conduits for the surface water.

Having provided for the discharge of the subsoil and the surface drainage, the next consideration is to provide an outfall as a substitute for the river in respect of the sewage in the low districts. The extent of this outfall will depend on the quantity of sewage. This will consist chiefly of the water supplied to the houses for domestic use, and such rain falling thereon as cannot be conveniently carried into the sewers provided for the surface drainage. In this case only an exception must be made to the general principle of keeping the house and surface drainage separate.

The Thames is the common sewer of London. Its tributaries, both open and covered, should be purified the same as itself, namely, by providing separate channels for the reception of the sewage. The best method of doing this would be to lay pipes upon or under the inverts of the existing branch and main sewers, and to connect all the house drains with these pipes. Then the house drainage would be diverted from the sewers, which would only receive and carry off the surface drainage, and thus the metropolis would be perfectly drained.

It is not intended to discuss here the merits of liquid and solid manure, but to show how the metropolis and the river may be relieved of the sewage, which may be led and raised into reservoirs and filtering tanks in the Essex and Kentish marshes below London, and there disposed of for agricultural purposes. The sewage of the high grounds could be intercepted, and distributed over distant agricultural districts on a lower level by gravitation, and lifted for distribution on higher levels by mechanical power. To suffer the sewage to flow into the river when it cannot be put upon the land would be to pollute the river, and thus the first principles of sanitary improvement would be vitiated. Main outfalls therefore should be provided to receive and discharge the house drainage of the metropolis at such times, independently of the river. By this system the metropolis and the river would be permanently relieved from sewage. Towns can only be properly drained by the adoption of these principles.

AN ENGINEER.

THE RAILWAY SYSTEM.

AT the ordinary meeting of the Institution of Surveyors, held on Monday, March 8th, Mr. John Clutton, president, in the chair, the discussion on Mr. J. Bailey Denton's paper was resumed by Mr. J. W. Barry, who thought it could not be anticipated that owners would give their land for railways, or subscribe for the shares, as expected by Mr. Galbraith. He thought if expensive accommodation works were demanded the district should contribute in some way towards the cost. Light railways following the contour of the country would be impracticable in hilly districts, which would entail heavy gradients, and consequently heavy engines and costly permanent way.

Mr. J. H. Lloyd did not agree in the strictures passed on the landowners. No doubt, in earlier days the invasion of estates by railways was considered as something horrible, and large amounts were paid as compensation; but he thought Mr. Denton had gone a little too far, and no inflexible rule could be laid down. There would be a great deal of practical difficulty in applying the principles of the Land Drainage and Improvement Acts to such cases as these. He instanced the Land Clauses Consolidation Act for Ireland, under which an arbitrator was appointed by the Government, to whom was referred every question of accommodation works and compensation, as being a very convenient Act, and capable of easy application. Mr. Lloyd suggested that a committee might be usefully appointed to consider the whole question in conjunction with the Institution of Civil Engineers.

Mr. Francis Vigers thought something might be gained if the surveyor, in conjunction with the engineer, advised on the course of the line before the plans were made public, and thus be enabled to negotiate the compensation on better terms.

Mr. E. J. Smith thought the landowners and the existing railway companies should combine to make branch railways, the landowners undertaking to guarantee a certain moderate percentage on the capital.

Mr. T. Marr Johnson said that in laying out the Metropolitan Railway they were greatly indebted to surveyors for their assistance. He thought something must be conceded by the public if branch railways were to be constructed economically, and the first thing to be given up must be high speed, which involved heavy engines, costly permanent way, and excessive wear and tear. The branch lines must be of the same gauge as the main lines, and would probably resolve themselves into two classes; one adapted to flat countries, where the rolling stock of the main line could travel; and another for hilly countries with steep gradients, which would require special working plant, carriages as well as engines.

Mr. R. C. Driver mentioned an instance in which a proprietor, having received a large sum for damage to his estate, and the property afterwards realizing more than it was thought originally to be worth, returned the amount received to the railway company.

Mr. J. Bailey Denton expressed himself satisfied with the course the discussion had taken, and said the whole question resolved itself into this, that if railways were to be made at something like 5,000*l.* per mile some way of paying less than 240*l.* per acre for land must be devised; for with eight or ten acres per mile that would absorb at least 2,000*l.*, and practically put a stop to further proceedings.

The President mentioned that on the purchase of land for a certain railway he had to pay 300*l.* per acre for land not worth 30*l.*, because it was alleged the railway would frighten the nightingales out of the wood. Landowners were not the only plunderers. He had sold 2½ acres to a railway company for 900*l.* One acre was used for the railway, and the company demanded 1,250*l.* for the remaining 1½ acre; so that those who complained the loudest, when they became landowners themselves were equally exorbitant in their demands. He thought the question of giving land for railways depended in a great

measure on the size of the estate and a variety of circumstances which would prevent a general rule being laid down; besides, this sacrifice should not be expected exclusively of the landowners, as every class of society was benefited by their construction. He was sorry to hear so high an authority as Mr. Lloyd say that proceedings similar to those under the Inclosure and Drainage Acts could not well be applied to railways, and he quite agreed with the proposition to appoint a committee to consider the whole question.

After some further conversation on the subject, it was resolved—

"That it be left to the Council to nominate a Committee for the purpose of considering what steps, if any, can be taken to promote the extension of the railway system, especially in agricultural districts; and that the Council of the Institution of Civil Engineers be invited to co-operate in any way that may be thought desirable."

DRAWING AND PAINTING IN RELATION TO MATERIAL AND IDEAL ART.

AT a meeting of the Society for the Encouragement of the Fine Arts, on the 11th, Mr. T. R. S. Temple, the honorary secretary, in the chair, a paper was read by Mr. Henry Tidey on "Drawing and Painting in Relation to Material and Ideal Art." He said,—With the differences of opinion about art, it was necessary to revert to nature. Man was a compound of spirit, mind, and matter, and became, as one or the other predominated, the man of genius, as the poet; the man of talent, as the scientific man; and the man of ordinary ability, who was inevitably subject to the other two. The vitality of works of genius was remarkable, Shakspeare himself being to us but a dream compared with the reality of his Falstaff. Poetry, music, and sculpture were in advance of painting; for in the word-pictures of Shakspeare or Shelley, in sound-pictures of Beethoven, and in the stone-pictures of the ancient Greeks, is to be found a more thorough realization of the ideal, a more complete supremacy of spirit and mind, than is presented in the works of any painter with whom we are acquainted.

The commonest of the commonplace in Rembrandt is redeemed only by the marvellous chiaro 'scuro and textual power. Rubens is gorgeous, but decorative, rather than spiritual. Raffaelle, if spiritual, is often grotesque in drawing, hard in outline, and crude in colour. Murillo never attained the divine, at which he aimed. Mr. Tidey next turning to the consideration of colour, remarked that the pigments in use at present represented but imperfectly primitive colour,—a defect that was not to be remedied, however, by the very common mistake of putting vermilion in the place of primitive red. He then, with the help of several diagrams, explained, first, Mr. Benson's system of the science of colour, and afterwards the ingenious theory of Mr. Hay, of Edinburgh, pointing out the close connexion as shown by him to exist between form, colour, and musical sounds; form being exemplified in the circle, triangle, and square; *colour* in the prismatic rays; and harmony in the different chords of music. He entered also into a minute examination, illustrated by diagrams of the perspective of the pre-Raffaellites, and into other technical matters, such as the agreeable effects produced by engraving, from black, comprising the three primitive colours, the balance of colour in pictures, &c. Ary Scheffer's he characterized as in a minor key of colour, and concluded a paper, which was greatly applauded, with the remark that the schoolboy now had more facilities for acquiring the true principles of art than artists formerly enjoyed.

The chairman said,—At a time when it was the custom to refer everything in art and science to first principles, it was most important that the practical as well as the theoretical man, as on the present occasion, should give us the result of his experience. The love of reality was a characteristic of the age, yet the imitation of material substance was but the first stepping-stone to fine art, the beautiful thought and expression being the life and soul of it. With respect to Greek art, it was no wonder that it flourished under the threefold influence of religion, climate, and the applause of a people who thoroughly appreciated and rewarded art. Mr. Fahey, whilst defending the pre-Raffaellite school of painting, remarked that a great authority had said an artist ought to be able to paint down as well as up to his public. Dr. Heinemann said such a principle as that suggested by Mr. Fahey could not be too strongly condemned. Messrs. Sadlier, Dutton, Postlethwaite, and others addressed the meeting on the various topics of interest that had been raised. After a cordial vote of thanks proposed by Mr. Gilks to Mr. Tidey, who replied to some of the objections, and with a vote of thanks proposed by Capt. Brittan to the chairman, the proceedings terminated.

PARK LANE.

WILL you grant a small space in the *Builder* to suggest a plan for the improvement of Park-lane, which, I think, has not yet been duly considered.

The Board of Works have announced their intention of purchasing the two houses at the north-east corner of Hamilton-place; if they also purchase the house at the corner of Piccadilly they will be able to continue Park-lane to Piccadilly at the same width throughout, and it will be possible to give up a narrow strip of ground in front of the houses on the west side of Hamilton-place, to be used, not as a garden, but for a private carriage-way. If this be done, the inhabitants of Hamilton-place will be in a great measure compensated for the loss of the privacy which they now enjoy; and as the carriages at their doors will not be in a crowded street the public will gain much. A RATEPAYER.

THE MANAGEMENT OF ENGLAND'S ROADS.

REGARDING the management of England's roads, much interest has of late been manifested. Improvement being sought for, about four or five years ago an Act was passed for the amalgamation of parishes. Under its provisions the representatives of each parish in a petty sessional or union division form a district highway board, the board appointing a surveyor and clerk as its officers. Strange to say, these boards, though made up of such rude elements as compose boards of guardians (and, goodness knows, we have heard enough of boards of guardians lately to judge as to their capability for transacting business), are virtually irresponsible; they spend what money they wish, as they wish; their accounts may chance to be audited by a zealous member of their own board, or, as in other instances, the accounts may be regarded as a nuisance, interfering with the delight of fault-finding, and they may be never audited. As a vice-chairman of a highway board once said, when some one thought it was well that the accounts should be examined, "Augh! d—the items, it's the totals we want,—aw, aw, aw!" A mistake was made even in the Act itself, by making it permissive. The onus of introducing the Act was made to rest with the Court of Quarter Sessions, thus casting thereon unnecessary odium.

As was prognosticated from the first, those disorderly gatherings called highway boards are now found to be utterly incapable of the management of the duties thrown on them, and indeed the Legislature must have been sanguine to have otherwise anticipated. They began their errors by giving small salaries to their surveyors and comparatively large salaries to their clerks. Now, the whole well-being of a highway district depends upon the surveyor; yet the office was in many cases put up by tender, to be obtained by him who bid the lowest sum, regardless of all qualifications for the office. Always accusing the magistrates of jobbery, they themselves have been guilty of the grossest jobbery; they have introduced as surveyors of England's roads farmers who could not make their farms pay, the son of an eating-house keeper, horse jobbers, tax collectors, and men of the like standing; but who or what the man, he has a salary which an educated gentleman, educated as an engineer, would not submit to, even supposing such a one allowing himself to serve a district highway board. The surveyor being incapable, the roads, as a whole, get worse (some parts get better); people using the roads complain; the rates get higher, all complain; then the boards, not finding fault with themselves, do as they are now doing so markedly in Yorkshire, cry out that the Legislature, through the magistrates, has hurt them,—not seeing that the hurt has been caused by their own short-sighted policy. But, supposing the surveyor chances to be a man who is capable of doing the work of the highway board, even then the Act does not work well: the board is ever seeking some cause of complaint against him (not working with him): as one surveyor said some time ago, "Oh, I was told a farmer said, 'We don't want fine gentlemen as surveyors, who come into our parish with fine gold chains.'" He happened to wear a gold chain to his watch. Or, as in the case of another surveyor, who at last resigned his office in disgust,—"My dear! he goes about the roads with a silver-handled whip, big as life, d—n his eyes."

All this takes the spirit out of the very best officer, and at last he finds a clerkship in a merchant's office infinitely preferable. But though the Government may be aware of the ill-working of the Act, of the incapability of highway boards, they are, as rapidly as possible, giving them more work to do.

As fast as the debt is paid, the turnpikes throughout the kingdom are being abolished, and put under the care of these boards. They are not simultaneously abolished, but only as they pay off their liabilities.

Now, in every way, this is a great injustice. Adam Smith says, in his "Wealth of Nations," that a "fairer way of raising a tax than the present toll system cannot be conceived." But, admitting the inconvenience and injustice of the toll system, surely the parish through which the turnpike-road happens to run should not be made to maintain it.

Turnpike-roads are the main arteries of commerce (subsidiary, of course, to railways); they run from one town to another, being fed in a measure on their way by the parish roads. Turnpikes are as much for the accommodation of the town as of the country; therefore it is a hardship of the country as against the town to maintain them. The parish, for its own benefit, maintains roads that thread through its most important parts, connecting those parts with the through turnpike-road. The town, for *its* own benefit, maintains a network of roads in connexion with the turnpike-roads branching from its borders.

Now for the remedy, for which a great cry is being made. The points to be held in view are the existing debts on the different trusts, and the incapacity of the highway Boards.

Is not the following suggestion worthy of thought? The highway boards should not have the care of the turnpike-roads.

The turnpikes should be regarded as imperial roads, and maintained as such by an imperial tax (whether on horses or carriages). They should be amalgamated; two, three, or four trusts, according to their size, should be collected under one management; the present trustees of the two, three, or four to be the trustees of the new one. There should be one staff for the amalgamated trusts, thus at once materially reducing the cost of management.* The cost of maintenance of these amalgamated trusts should be defrayed by an imperial tax; and in case one or more of the trusts should be in debt, the toll-gates on that part should be allowed to remain, until the whole of the debt was discharged, the entire receipts from the tolls being devoted to that purpose. As it is an injustice that these highway boards, who do not fairly represent the ratepayers (inasmuch as business-men really cannot afford the time; and even if they could, would decline to associate with such people), should have an irresponsible control, they should (as also the amalgamated trusts) be subject to a central government board of control, possessing similar powers to the Poor-Law Board. Each county, or two or three counties combined (dependent on their size), should have a surveyor-in-chief, who should also act as auditor. As it would be well that this chief surveyor should know something of the personal characteristics of the county or counties to be under his care, the Court of Quarter Sessions (or combined courts, as the case may be), should be directed to nominate the gentleman for the office, such nomination to be subject to the approval of the Secretary of State. But such chief surveyor should alone be responsible to the central board, who should name their salaries, and in fact be with the foregoing proviso, and under reference always to the Secretary of State, the servant of the central board. Thus the district under the chief surveyor would have all its accounts audited, it would have a gentleman at hand to direct and advise; it would have one system of roadmaking, and one system of account-keeping; unnecessary expense would be checked, a power

* It would not reduce the cost of management but a very trifle more by making the highway boards accept the management; as with increase of work, their officers would expect increase of pay.

to keep the district up to the work would be at hand (for again and again has been heard the remark from members of highway boards,—"We are not bound to make gentlemen's carriage-roads of the parish roads"), the highway surveyors would be able to breathe, and would then perhaps find it unnecessary to touch their hats as much as they do now; and the clerks would find themselves simply clerks, and not clerks and the board too.

It has been suggested in influential quarters that the turnpikes should be abolished, thrown on the highway boards, and the whole maintained by an imperial tax; but that would be fair only when the town roads are allowed to join in the benefits of an imperial tax. The town maintains its own roads, the country should maintain *its* own roads—the roads joining the towns,—by the imperial tax.

As for the metropolitan roads, they should be treated something in the same way; one surveyor-in-chief acting also as auditor, subject to the central Board of Control; and dividing London into four or five districts, the representatives of each parish in a district should form a board, it appointing its staff. PRO.

FOUNDATIONS IN RIVERS.

THE INSTITUTION OF CIVIL ENGINEERS.

AT the meeting on March 2nd, Mr. C. Hutton Gregory, president, in the chair, the first paper read was "On Sinking Wells for the Foundations of the Piers of the Bridge over the river Jumna, Delhi Railway," by Mr. Imrie Bell.

After alluding to the native plans of sinking wells, built of masonry or brickwork, by excavating the sand from the interior, at first by means of a spade called a "phaōra," and after the first 5 ft. by an implement called a "jham," reference was made to a modification in the use of the jham in constructing the railway bridge over the Jumna at Allahabad, where, instead of sending down a diver to force the spade into the ground, a pole was employed to strike the butt end of the jham, and so to drive it into the ground. This was, in the author's opinion, a decided improvement; but the process was still tedious and slow, especially where clay or hard strata were met with.

The author then proceeded to describe the mode of forming the foundations of the bridge over the river Jumna, near Sirsawa, on the Delhi Railway. It appeared that the bed of the river at this point consisted of coarse and fine gravel and sand, interspersed with layers of blue clay 3 ft. and 4 ft. thick, and covered with silt; but, during the rainy season, large boulders, weighing 14 lb. each and upwards, were brought down, and deposited by the scour of the river 30 ft. below the level of the bed. The bridge comprised twenty-four openings, each 99 ft. in the clear, and the superstructure was composed of two lines of lattice girders, resting on brick columns, or wells, each 12 ft. 6 in. external diameter, and 5 ft. 10 in. internal diameter; so that the wall of the well was 3 ft. 4 in. thick. In some instances the sites of the piers were got clear of water by diverting the river at different points during the dry season, while in other cases islands were formed, by driving a half-circle of piles on the up-stream side, then lowering sand-bags on the down-stream side, to the height of 4 ft. or 5 ft., and afterwards filling up with sand to 5 ft. above low water. The curb on which the steining of the well rested was formed of wrought-iron plates and angle-irons riveted together; and in cross section the curb was like an inverted right-angled triangle, of which the height was 4 ft., and the base 3 ft. 4 in. When each curb was complete, it was moved into position, and the compartments were then filled in with concrete. The curb was next sunk by men working with the phaōra and basket, till the upper edge was within 3 in. of the level of the water, when a ring of brickwork was carried up for a height of 6 ft. The excavation of the interior was again proceeded with, by means of the jham and divers, in the old native style; afterwards a further height of 10 ft. of brickwork was added, but the material was now removed by a sand-pump (to be hereafter described) worked by a steam-hoist of four-horse power, as was the case after two additional lengths, each of 15 ft., were built, when the well was carried down to its full depth. In operations of this nature great care was necessary, especially at first, to insure the well, or cylinder, descending vertically. For this purpose the curb should invariably be sunk alone without any building. The first height of brickwork should not exceed 5 ft. or 6 ft., the next 10 ft., and it was never advisable to build more than 15 ft. at a time. Before commencing any additional height, the top course of the brickwork already built ought to be removed, to insure a thoroughly clean surface for the mortar.

The well-sinking for the foundations of the piers and the abutments of this bridge was completed in little more than two years, which, without deducting any time for building up the brickwork, or for that unavoidably lost by the rise in the river during rains, gave an average rate of 159 ft. per month. The time occupied in the building of the steining of the wells, erecting, taking down, and re-erecting scaffolding and staging for sand pump, weighting the wells, &c., was equal to that employed in sinking. This would give the rate of sinking as a little over 300 ft. per month. If cast-iron cylinders had been used, the work could have been performed much more quickly, as the portions of the cylinders could have been put together more rapidly, and owing to the slight bearing surface exposed by the thickness of the iron, compared to the breadth of brickwork in the walls of the well. The total weight of the foundations and of the iron girder superstructure on each well was 420 tons, and the area of the bottom of each well was 117 ft., so that the weight was less than 4 tons per square foot.

The novelty in the sinking of the wells of this bridge was in the use of the Sand Pump. This was described to consist of a wrought-iron cylinder having a pump riveted to it at the top, in which was a piston fitting loosely, and pierced with small holes to allow of the escape of water. The piston rod terminated in an eye at the upper end, to which a chain could be attached. The bottom of the cylinder was moveable, and in the centre there was an upright suction-pipe, projecting outwards for a distance equal to its own diameter, and inwards nearly to the top of the cylinder. When the pump was lowered to the bottom of the well, the chain attached to the piston rod was worked up and down like a ringing engine. In this way water was first drawn through the upright pipe, followed by sand or other material, which fell over the pipe into the cylinder. This operation was continued until the cylinder was quite full, which was known by the piston working stiffly, when the machine was raised to the surface; the bottom of the cylinder was then detached, with the column of sand resting on it, and another cylinder bottom which had been cleared of its sand was substituted.

COMPETITIONS.

Newport.—Church of Scotland Chapel.—The committee of this chapel have selected the design of Mr. Alexander Johnston, architect, Dundee. There were five competitors. The design of Mr. Mackenzie, of Dundee, was second.

Yorkshire Investment Company, Leeds.—In the sale of sites forming part of the corporation scheme for the widening and improvement of Boar-lane, an important plot of ground was acquired by the Leeds and Yorkshire Land, Building, and Investment Company (Limited). It consists of the space occupied by the Railway Hotel and adjoining premises. To secure a structure worthy of the site, the directors invited architects to send in competing plans. Out of a number sent in they have selected the elevations and plans of Messrs. Mallinson & Bakewell, architects, East Parade, Leeds, the premium for the second best set of plans having been awarded to Mr. Harris, architect, East Parade, Leeds. The plans of Messrs. Mallinson & Bakewell provide for the erection of a hotel, embracing a restaurant, luncheon bar, &c., and two first-class shops. The new building is Renaissance in style. The main entrance to the hotel will be in Boar-lane. In each of the three stories above the doorway are oriel windows.

Rotherham Hospital and Dispensary.—About eighty designs had been received on Monday evening last, March 15th, by the hon. secretary of the building committee, in answer to his advertisement inviting architects to submit plans in competition for this hospital. The designs will be hung at once in the Mechanics' Hall, and the sub-committee meet this week to decide on the further steps to be taken in order to secure a fair selection.

Baptist Chapel, Glossop-road, Sheffield.—Some time ago a movement was made amongst the members of the Townhead-street Baptist Chapel for the erection of an additional chapel in another part of the town. A suitable site was found in Glossop-road, at the junction of Northumberland-road, and the new building was projected to cost from 5,000*l.* to 6,000*l.* The tender of designs for a suitable edifice was invited, and plans submitted by the following architects were exhibited in the Cutlers' Hall. The mottoes attached with each design are subjoined with the name:—Messrs. Hill & Swan, "*Experientia docet;*" Messrs. Flockton & Abbott, "Two triangles;" Messrs. Blackmoor & Mitchell-Withers, "*Excelsior;*" Mr. J. P. Pritchett, Darlington, "*Labor et spes;*" Messrs. Lockwood & Mawson, Bradford, "*Experientia docet;*" Mr. J. C. Hine, Nottingham, "*Omnibus electus;*" Messrs. Pavell & Robinson, Manchester, "Q;" Messrs. Innocent & Brown, Sheffield, "*Nota Bene.*" The last named were the successful competitors. The style of the building is Gothic. The spire is placed so that its full height of 140 ft. is seen. The school adjoining is 54 ft. long, 24 ft. wide, and 17 ft. high, with accommodation for 250 children.

The Infant Schools at Sutton.—There were thirty-five designs sent in, and after consideration of their merits, the managers made the following selections for the prizes of 40*l.* each:—

1. Mr. W. Wallen, Greenwich	£15,973	0	0
2. Messrs. Wilson & Willcocks, King William-street, Strand.....	11,000	0	0
3. Mr. Chas. J. Phipps, and Mr. F. M. Harvey, Mecklenburg-square ...	14,500	0	0

SCHOOL-BUILDING NEWS.

Chester.—The foundation-stone of new Sunday schools for the Methodist new connexion has been laid. They are to be built at the rear of, and immediately behind, the chapel, a small space intervening. On the basement there will be two class-rooms, 11 ft. 6 in. by 22 ft. 10 in., and one larger, 20 ft. by 22 ft. 10 in., each room being entered by a separate door. Above these will be one large schoolroom, 44 ft. 6 in. by 22 ft. 10 in., lighted by five windows; each of the class-rooms being lighted by one window. These rooms it is expected will accommodate 300 scholars. Below the class-rooms there are boilers for heating water at tea-parties, store-rooms, &c. The building will be of brick, with stone facings, and will cost, when completed, about 350*l.* Mr. Walter Boden, of Chester, is the architect; Mr. H. Pearson, the builder; Mr. J. Duckers doing the stonework.

Bilston.—The Wesleyan new schoolrooms, erected at a cost of 1,000*l.*, have been opened. The school is a brick building, composed of a central room 58 ft. 6 in. long by 45 ft. wide, with a range of four class-rooms on each side 8 ft. square, and two class-rooms 15 ft. 6 in. by 8 ft. each. There is also a gallery for infants at the entrance. The walls are wainscoted to about 5 ft. high. A platform pulpit is erected on the east side of the schoolroom, which may be easily partitioned off to divide the boys from the girls. The school will accommodate about 600, and it is decided to have a day and infants' as well as a Sunday school. Almost the entire cost of the erection has been already raised.

Birkenhead.—The new boys' school, in connexion with St. Ann's Church, Birkenhead, has been formally opened. The new buildings are erected from the designs of Mr. David Walker, of Liverpool, and provide accommodation for about 200 scholars, the plans being in accordance with the Committee of Council regulations, from whom a grant in aid is obtained. The schoolroom is 77 ft. long by 20 ft. in width, and there are two class-rooms, each 25 ft. 6 in. by 15 ft. in width, together with a cloak-room, lavatory, entrance porches, and all usual conveniences, a large playground being likewise provided. The roof timbers of the schoolroom are exposed to view, and varnished; and the walls are coloured a warm tint on the brickwork, finished with a skirting, 4 ft. high, in oil paint, and capped with a stencil border. The class-rooms are fitted up with galleries. The style is Gothic, of an early character, and the building is constructed almost entirely of brick. The site of the new buildings, which adjoins the old, was presented by Mr. Thomas Brassey, who also gave a liberal donation towards the building fund. The cost of the works will be above 1,200*l.* Messrs. Booth & Richards, of Rock Ferry, were the contractors.

Doncaster.—The new building which has just been completed for the Doncaster Grammar-school, at a cost of something like 7,000*l.*, was to

have been formally opened on Friday before last. At the last moment, however, circumstances arose which led to a difference of opinion between the charity trustees and the head master, and it was resolved that the pupils should re-assemble in the old building.

Carlton (*Notts*).—New day and Sunday schools have been opened at Carlton, in connexion with the church there. The schools are erected on a site which had been presented for the purpose by the Earl of Chesterfield, and are in the Tudor style of architecture. The cost incurred was about 1,900*l*., including the site and alterations at Gedling Schools. The schoolrooms are sufficient to seat about 400 persons. The playgrounds for the children are asphalted, and provided with swings and other appurtenances.

Great Horton.—In addition to the large Sunday and day schools which are being carried on by the friends of the Church, the Wesleyans, and the Primitive Methodists, the services in connexion with the opening of large and extensive school premises, which have recently been completed by the Congregationalists, have just been held. When the sum of nearly 2,000*l*. was raised, plans were prepared by Messrs. Paul & Robinson, of Manchester, and the different works were let to Messrs. Booth, Illingworth, & Son, contractors, Bradford, and the erection is now completed. The site is in a prominent position fronting the main road. A level street separates the building on the south-west side from the chapel premises, and the north-east side is also flanked by a street, but the ground here falls to the extent of 12 ft. Advantage has been taken of the difference of level, the class-rooms for infants and week night scholars being placed on a lower ground story, with separate external entrances from the side street. The area of ground covered by the building is about 550 superficial yards, the dimensions being 120 ft. by 41 ft. The height from the floor to the ridge of the roof is 52 ft. On the ground-floor there is an assembly-room, which is 65 ft. by 38 ft. and 16 ft. high, having separate entrances from the front street, and communicating directly with the lobby at another entrance on the north-west side. This room is lighted with gas by means of six pendants suspended from the ceiling. In the rear of the assembly-room there is a lecture-hall, which is 36 ft. by 26 ft.; and the same height between the assembly-room and the lecture-hall, and ascending from the side entrance lobby, there is a staircase leading up to sixteen class-rooms above, which extend in double row with vertically lighted passage between them, the entire length of the building, and at the end of the passage a room is provided for the superintendent, who will have a view of the entire range. On the lower ground-floor and underneath the lecture-hall there is a class-room 25 ft. by 20 ft. and 14 ft. high, containing a raised gallery, which will accommodate 100 infants. This room is lighted by large windows from the street on the lower side. On the same level there are two class-rooms for adults, specially adapted for week evening purposes.

Newmarket.—Much-needed school and church accommodation for All Saints parish will, through the exertions of the vicar, be probably very shortly provided. The site given by the Duke of Rutland for the new school is near the vicarage. The principal inhabitants of the town are contributing liberally towards the building funds. The school will be commenced early in April, and the enlargement of the church as soon after as convenient.

FROM AUSTRALIA.

Melbourne. — THE new bridge at Keilor, erected across the Saltwater River, has been opened. Messrs. Brown & Son, of Camberwell, were the engineers. The bridge was constructed on the site of the former one, which was a wooden frame bridge of the American style, and was erected at great cost in 1853. The contract for the present bridge was let in October, 1867, to Mr. Enoch Chambers, for 4,664*l*., which included the masonry of the towers, the raising of the old piers 3 ft. 11 in., and the buts and platform of the bridge. Two new piers, however, have occasioned an additional outlay of from 900*l*. to 1,000*l*. The masonry was commenced in December last; the iron for the construction of the tubes arrived from England in June, and their erection commenced in July, and the whole of the work, excepting the approaches, was completed in October, without accident to life or limb. The cost of the entire work, including the service bridge and the approaches, is upwards of 6,000*l*. The weight of each iron girder is about 50 tons, and the platform also about 50 tons, making a total weight of 150 tons. The bridge is 142 ft. in length, and 136 ft. between the points of support, and 20 ft. wide. 41,000 rivets have been used in its construction. It has been tested with a load of 142 tons placed equally on the girders, and with this weight it deflected 1 inch, and on the removal of the testing weight the girders rose to their original camber. The actual strength of the bridge, exclusive of its iron weight, is 980 tons, and the working power 326 tons.

Competitive designs are invited by the executive committee of the projected Prince Alfred Hospital. A premium of 50*l*. is offered for the first, and 25*l*. for the second best design.

The Victoria School of Design, in connexion with the Gallery of Art, has from thirty to forty students, but no master. One result is that not more than six or eight students attend with any steadiness or regularity. If the school (if we can call it a school) is to become useful, it must be provided with a competent master.

Sydney.—The new General Post Office, now in course of erection in Sydney, has a frontage to George-street of about 80 ft. and 170 ft. to a proposed lane which will connect George-street with Pitt-street. The business of the Money Order and Telegraph Departments will be transacted in the building as well as that of the Post Office. Sydney freestone is being used in the erection of the building principally, with the exception of such portions as the base-course, the columns, and capitals of the arcades, &c., requiring additional strength, where granite will be employed to resist the pressure. Of this an abundant supply of excellent quality and various colours can be obtained at several places along the coast between Sydney and Cape Howe. Internally, brickwork and wrought-iron will be used as far as practicable. The design is Italian, by Mr. James Barnet, Colonial Architect of N.S. Wales, and the contractor is Mr. John Young, of Melbourne.

DISSENTING CHURCH-BUILDING NEWS.

Bredgar.—The new Wesleyan chapel here has been opened for divine worship. Mr. R. Carey, of Coxheath, gave the bricks and the land, the cost of the labour and woodwork being about 1,000*l*. The building was designed by Mr. Carey, jun., of London, and carried out under the direction of Mr. C. Pillow, of Milton. Mr. Beaumont, of Milton, was the builder; the candelabra were supplied by Mr. A. Buley, of Sittingbourne, who likewise did the staining and the glazing. The size of the chapel is 50 ft. by 30 ft. in the clear, and it will seat 300 persons. The style is Gothic. There are a school-room and vestry at the end. As the land upon which the chapel is built is at a considerable elevation, it is a prominent feature in the landscape for some distance.

Yeovil.—The foundation stone of a Wesleyan chapel has been laid here. The new edifice is intended to accommodate 700 people, the cost being 3,000*l*., including site. The architect is Mr. Lander, of Barnstaple; and the builders are Messrs. Bartlett, of Coker.

Stratford. — The foundation-stone of a new Unitarian chapel has been laid here. The site is in Ham-lane, near the new Townhall, Stratford. The cost of the site and building is estimated at 1,200*l*. It is expected the building will be completed in June. Mr. Clark is the architect, and Mr. Thomas Horken contractor.

Dundee.—A new Wesleyan chapel is being erected in Wellington-street, from the designs of Mr. Alexander Johnston, of Dundee.

METROPOLITAN ASSESSMENT BILL.

SIR,—Allow me to call attention to one provision in Mr. Goschen's Bill, which appears to me to perpetuate a fallacy which has long existed relative to deductions to be made from the gross estimated rental in respect of repairs and insurance.

For the purpose of this communication I have this morning inspected the rate-book of one of the city parishes, and subsequently a house, the gross estimated rental of which was there stated to be 500*l*., and the rateable value 20 per cent. less, viz., 400*l*.; of this amount I venture to say the structural value is only 100*l*., the remainder being the value of the land; 20 per cent. from the gross amount would therefore equal the total annual value of the structure to be repaired.

I would suggest the following plan, which I am adopting in the valuation of a union for poor-rate assessment, viz., to make the deduction a per-centage on the structural value only, and for this purpose discarding altogether the value of the land.

A carefully-prepared table on this basis, though working some inequalities, would, I venture to think, be far more just than the plan now adopted. WM. EVE.

STAINED GLASS.

All Saints' Church, Souldrop, Bedfordshire.—Another window has just been filled with stained glass, by Messrs. O'Connor, of London, for the chancel of the church in this village. The window consists of one large circle and six small openings, and being above the organ, subjects from the Te Deum were thought to be suitable. Thus the centre light represents our Lord in majesty, with two angels in adoration, and the six other lights are filled with various subjects, such as the angels Michael, Gabriel, Raphael, and Uriel, with their respective emblems; the apostles Peter, John, James, and Paul; the prophets Isaiah, Jeremiah, Ezekiel, and Daniel; and the martyrs, John Baptist, Stephen, Matthew, and Andrew.

St. Peter's Collegiate Church, Wolverhampton. The three main lights of the Lonsdale window are intended to recall to the mind Bishop Lonsdale, as Bishop, Father in God, and Church Restorer, by the following figures:—Melchisedec, priest and king, bearing the bread and wine; St. John at Ephesus, with a long white beard, and having in his right hand a writing style, his left hand resting on the head of a child standing at his side; Ezra, the priest, holding three scrolls, representing the Law, Prophets, and Sacred Writings. In the panels beneath these figures are three scenes from the history of St. Chad, first Bishop of Lichfield, A.D. 669. 1st. His consecration. 2nd. St. Chad, as Bishop of Lichfield and founder of the Mother Church of the diocese. 3rd. The death of St. Chad announced to him. The tracery is a flowing Decorated composition, and contains emblems of the Sacramental Cup, with serpent issuing from it, the Seven-Branched Candlestick, the Seven Stars (Rev. i. 16), St. Chad's Branch, &c. Along the base of the window, on a brass, is the inscription, "John, Bishop of Lichfield; consecrated 1843; died 1867." The artists were Messrs. O'Connor, of London.

PORTLAND CEMENT.

SIR,—Your correspondent, Henry Bird, in answer as to behaviour of Portland cement, gives causes and effects, but he does not point to the remedy, which, in my humble opinion, lies with the manufacturers, as they grind and sieve it too coarse, and send it out too fresh, more so in a busy time. These coarsely-ground particles of hard carbonate of lime take time to absorb the moisture, and, having done so, it swells; hence the upheaving of the joints in the brickwork, and what is termed, in plastering, the fire-cracking. Now the remedy would be for the manufacturer to grind and sift it finer,—pass it through a sieve, say twenty holes to the inch,—and let it lie in a dry place or bin exposed to the air for twenty-one days before use. Some of your readers may probably say it would take a great time to set: I find by experience the longer it takes to set the *harder* it gets.

WILLIAM PULHAM.

THE "BUILDER'S" LAW NOTES.

Pollution of a River by Sewage. — A Local Board of Health directed that the sewage of a certain town should be by means of drainage conveyed to a river. The sewage, not having been completely deodorised before coming into contact with the river, polluted the stream passing through certain lands so much that the fish were killed, and a nuisance was caused. It was held by the Court of Chancery that the owner of the lands through which the river passed was entitled to an injunction to restrain the continuation of the pollution of the water.—*Bidder* v. *The Croydon Board of Health*.

Railway Works diverting subterranean Water. —A Railway Company having constructed a tunnel on their own land, thereby diverted the subterranean water from plaintiff's land contiguous to the tunnel. Proceedings having been taken against the company for such diversion of the underground water, it was decided that they were not liable, as the act had been in the exercise of the ownership of their own land.—*Galgay* v. *The Great Southern and Western Railway Company of Ireland*.

Use of Public Fountain Water.—The Darlington Board of Health was empowered by statute to supply that town with water at certain rates for domestic purposes, and for other than domestic purposes upon such terms as might be agreed

upon between the Board and those desirous of having such supply. A public fountain having been presented to the town, the Board supplied it with water on market-days for the use of the cattle in the market, and for yoked horses passing to and fro. A person who kept horses, and was desirous to evade payment of the rate for the supply of water to his stable, took his horses to the fountain to drink. An information was laid against him under the Waterworks Clauses Act of 1847; but the magistrates, being of opinion that the Board had no right to limit the gratuitous use of the water at the fountain, refused to convict. The Court of Common Pleas set aside the decision of the magistrates, on the ground that it was quite competent for the Board to limit (as they had done) the supply of water to the fountain.—*Hildreth* v. *Adamson*.

Injury to a Stream by a Manufacture.—Certain calico-printers were for some years in the habit of using the water of a stream for the purposes of their works. Arsenite of soda is one of the substances used in the process of dying calico, and it was found that arsenic from the works above mentioned was traced in the mud of the reservoir of the Stockport Waterworks Company (some miles below the works), and also in the water supplied by that company to the town of Stockport. Proceedings were taken against the owners of the calico-printing works, and it was contended that the defendants might have prevented the arsenic from escaping, if they had constructed a large settling reservoir below the works. In defence it was alleged that such a course would have been very expensive; but no evidence was given as to the mode in which the works were carried on. The jury found that the trade was lawful, useful to the community, and properly carried on; but it was decided by the full Court that the verdict was not in pursuance of evidence; and also that, even if it were admitted that the trade were lawful, useful, and properly carried on, that would be no answer to the legal proceedings for being the cause of poison becoming mixed with the water.—*Stockport Waterworks Company* v. *Potter*.

DRAINAGE WORKS AT ARCAN, ROSS-SHIRE.

SOME improvements deserving of notice have just been completed on the Seaforth estate. The lands in question lie in the valley of the Conon, a few miles from the Muir of Ord Station on the Highland Railway. At this place the river Conon was sometimes so high for weeks, or even for months together, as to flood the fields to such an extent that they presented more the appearance of a loch than the fertile lands they really were. In order to remedy this state of matters, Mr. G. Cadell Bruce, C.E., of Edinburgh, was applied to, and he undertook to carry a tunnel all the way through the lands, passing below the river Orrin through part of the Highfield property, and discharging the water into the river on the Conon estate, immediately below the march between the Seaforth and Highfield properties. This work has been successfully accomplished, the result being that the flat of Arcan, extending over 800 acres, is now entirely free from water. From the surface of the ground at the inlet to the outlet there is about 14 ft. of fall. The tunnel is 2,142 yards in length—solid brick building—and there are also 500 yards of a large open watercourse, besides other drainage works. The work was begun in May last, and has been accomplished in the face of many difficulties, arising from the nature of the ground and the large gathering of water. The tunnel is constructed of radiating bricks, built with hydraulic lime, and partly laid in concrete. It is boxed in with piles of timber, and considerable difficulty was often experienced in conducting this work, owing to the shifting nature of the sand and gravel. The quantity of water which the tunnel will discharge, running half full, is about 100,000,000 gallons in twenty-four hours. The tunnel under the Orrin is 10 ft. below the bed of the river. These improvement works were carried out to a large extent on the lands of two proprietors, under the "Outfall Act" of 1847—one of the first instances, we believe, in which the conditions of this Act have been conformed to. One of the proprietors was averse to the execution of the drainage operations; but the Act was expressly intended to meet such a case. The contractor for the undertaking was Mr. George Hunter, Edinburgh.

THE VALUATION OF PROPERTY IN THE METROPOLIS.

THE text of the Bill to provide for uniformity in the assessment of rateable property in the metropolis, prepared by Mr. Goschen, Mr. Arthur Peel, and Mr. Ayrton, has been published. This measure provides for the establishment in the metropolis of a valuation board for the purpose of determining the per-centage of the rate of deductions to be made from the gross value in calculating the rateable value of heraditaments. The Board is to be composed of one representative from each assessment committee, and its proceedings are to be conducted in such manner and according to such regulations as the Poor-law Board may from time to time prescribe. The clerk of the Board is to be the clerk for the time being of the Metropolitan Asylum district. The right of appeal is to be given to any ratepayer and any surveyor of taxes who may feel aggrieved by the decision of the assessment committee. The same right is also accorded to the assessment committees, overseers, and any body of persons legally empowered to levy rates, if they feel aggrieved by reason of the gross or rateable value being too high or too low, or of there being no approved valuation list. The Poor-law Board is to be authorised to appoint commissioners for hearing appeals, subject to the consent of the Commissioners of the Treasury. One-half the remuneration of those officers and of their courts is to be paid out of the Treasury funds, and the other half by the managers of the Metropolitan Asylum district, who are to be recouped out of the Common Poor Fund. If a commissioner should find, on appeal, that there is no approved valuation list in any parish, he may appoint a person to prepare one, the costs to be paid by the assessment committee failing to approve the list. The Bill contains seventy-three clauses and five schedules.

THE WORKS OF THE LATE E. H. WEHNERT.

THE Institute of Painters in Water Colours have opened an exhibition in their Gallery, Pall-mall, of pictures and sketches by the late Mr. Wehnert, "with the sole object of doing honour to the memory of an early and much-esteemed member,"—and a very praiseworthy and honourable step it is. The collection, including 150 works, is one of great interest, and shows the industry as well as the genius of the artist, who struggled against ill health in the latter part of his career, and was prematurely cut off. The earliest picture, of which the date is given in the catalogue, is 14, "The Dinner at Page's House, from the 'Merry Wives of Windsor,'" the property of Mr. James Godwin; and the last is 127, "Recantation by Galileo of his Heresies before the Tribunal of the Inquisition," on which Mr. Wehnert was engaged at the time of his lamented death. The sketches and studies for pictures exhibited show well his manner of working, and the carefulness with which he prepared himself for the finished work.

ARCHITECTS' ACTIONS.

BREACH OF CONTRACT.

AN action was brought by Mr. E. H. Lingen Barker, against the Rev. J. Ormiston, as chairman of the St. David's (Islington) Church Building Committee, for a breach of contract, in wrongfully dismissing him from the position of architect, to which he had been appointed by a resolution of the committee. There were also special claims for plans prepared and other services rendered, and for the user of the said plans after his dismissal.

The case had been referred, by agreement, to the decision of Mr. Johnson, one of the Masters of the Court of Exchequer.

The defendant paid 70*l.* into court, and submitted pleas denying the contract; alleging that the contract (if any) was conditional; that the plaintiff had failed to fulfil the condition; and that the amount paid into court was sufficient for the work done.

The following is an outline of the chief facts, as disclosed by the correspondence:—

In June, 1866, plaintiff received instructions from defendant to prepare plans for the above church, to seat 1,200 persons, the cost not being named. Ultimately the accommodation was reduced to 1,007, when plaintiff stated he thought the cost need not exceed 4,000*l.* (afterwards increased to 4,300*l.*), paying strict attention to economy in matters of detail, and using inexpensive materials only. No guarantee, however, on this point was either asked for or given, and in November the plans were adopted by resolution, subject only to any future desired modifications. Funds having come in but slowly, it was decided, about October, 1867, to erect the nave of the church first; and plaintiff sent his plans to defendant, at his request, with this object, with estimates, showing the superior advantage of building the side aisles at the same time. Instead of noticing this suggestion, defendant showed the plans to Messrs. Dove, builders, who estimated the complete cost at 6,000*l.*; they, however, in answer to plaintiff's subsequent inquiries, admitted that this price was only approximate, as they had had no specifications, and only a "casual glance" at the plans; they further said, that doubtless the details might be simplified, so as to bring the cost down to about 5,000*l.*; and that, on receiving the plans and specifications, they should be able to say the lowest they could carry them out for. Plaintiff fully explained all this to defendant (who had himself previously stated to the secretary of the Bishop of London's fund that the cost would no doubt be 5,000*l.*), adding that his original estimate would now have to be raised to about that sum, owing to the increased cost of building since it was given, and for other reasons duly specified; he also alluded to the wide difference often existing between competition tenders, pointing out that defendant's mode of proceeding was such as to tempt the builders to name a high figure. And he finally reminded him of the original understanding, which was, that tenders were to be procured in competition; and that if the lowest was then found to exceed the available funds, the cost should be reduced by the omission of certain details principally ornamental. Notwithstanding these and further explanations, and an offer to modify the plans to suit the reduced state of the funds; and though he warned the defendant against involving his committee in the expense of two architects, plaintiff received, in April, 1868, a formal resolution terminating the engagement; and shortly afterwards a letter from defendant, referring him to his solicitor. An arbitration was then proposed, and acceded to at first by plaintiff, but afterwards declined, on hearing that, pending these negotiations, defendant had been using his plans and employing another architect, Mr. E. L. Blackburne. Indeed, under this gentleman's direction, plaintiff's rejected advice of building nave with side aisles has since been carried out by Messrs. Dove. After hearing the (admitted) correspondence, the Master stated that his impression was decidedly in favour of the plaintiff, and also that the amount paid into court was inadequate. He thought, however, a compromise might be effected at that stage, so as to spare funds collected for a charitable purpose; this hope being grounded upon the good feeling and moderation exhibited in plaintiff's letters. Ultimately it was arranged that the Master should certify for the defendant to pay the plaintiff's costs, and 80*l.* beyond the 70*l.* paid into court, and to return the plans.

HOUSE PAINTING.

SIR,—Can any of your readers inform me the reason why plain oil painting upon old work, when dry, has a flat and smeary appearance? If a light grey (for instance), the first coat will dry with a uniform gloss, but the second coat will be sure to be flat and smeary. I have inquired of many painters, but can get no satisfactory explanation. I use American turpentine, and have tried linseed oil from different houses, but with the same result each time: for the past few years it has been impossible, after the first coat, to make plain paint look well, with a decent gloss. Can the cause be in the white lead?

H. L. D.

FRENCH WORKMEN FOR THE TRINTY BOARD.

SIR,—I find this paragraph in the *Daily News*, and would call your attention to it:—

"*New English Lighthouse.*—The Trinity Board have entered into a contract with a French firm to supply and work the granite of a lighthouse, to be constructed on a rock near the present Longships, off Land's End. The new lighthouse will embrace all the modern improvements, and will, when completed, supersede the Longships. The Elder Brethren, it is said, have gone to France with the contract, in consequence of the high price asked by English firms. The work will be commenced immediately."

We have a very old proverb about carrying coals to Newcastle, but here is a job to be done in Cornwall, and the material is Cornish granite, and workmen there are as much unemployed as they are at this moment in other parts of England and as badly paid,—ay, and worse, for there is no district in England where wages rule as low as they do there; and yet, when a little job like the foundation of a lighthouse has to be done, our rulers must, forsooth, send the order to France. I must confess my disgust at the transaction. But I am told that the price asked by the English contractors who were applied to was too high, and the French asked less. I leave out altogether any question of patriotism. My reply is, take a wider circle. We English go abroad and compete there with all nations, and on their own soil, and shall it be said that we are beaten at home? These things are done in a corner, as the recent magisterial investigations prove. Let every job of this kind be well advertised in the journals devoted to the trade, so that contractors generally may be made aware that such work has to be done; and I am sure that, after that, they need not go to France or any other country for tenders of any kind of building.

A CLERK OF WORKS.

PERPETUAL MOTION.

In the *Gentleman's Magazine* for 1818, p. 156, vol. ii., appears the following curious account:—"John Spence, an ingenious individual, residing at Linlithgow, in Scotland, has applied the magnetic power to the production of a perpetual motion. This person was in early life apprenticed to a shoemaker, but the natural bent of his genius for mechanics overcame every obstacle. He got to be keeper of a steam-engine, in a spinning factory at Glasgow, and after two years' study in this school, retired to his native place to pursue the shoemaking for bread; and wheels, levers, &c., for the gratification of his own taste. The perpetual motion was an object worthy of such a devotee, and we find that he has invented a piece of mechanism which is doubly curious, from its own powers, and from the extraordinary difficulties in whose despite it has been accomplished. It is not easy to convey an idea of it without plates. A wooden beam, poised by the centre, has a piece of steel attached to one end of it, which is alternately drawn up by a piece of magnet placed above it, and down by another placed below it: as the end of the beam approaches the magnet either above or below, the machine interjects a non-conducting substance, which suspends the attraction of the magnet approached, and allows the other to exert its powers. Thus the end of the beam continually ascends and descends betwixt the two magnets, without ever coming into contact with either, the attractive power of each being suspended precisely at the moment of nearest approach. And as the magnetic attraction is a permanently operating power, there appears to be no limit to the continuance of the motion but the endurance of the materials of the machine. The first machine made by Mr. Spence is very rude, and fashioned by his own hands; but he intends applying the principle to the motion of a timepiece. We trust this ingenious man will meet the encouragement he deserves; if not as the reward of his talents and perseverance, at least for the benefit of the community, for it is from such sources that great national improvements are often derived."

Such is the article *verbatim*, and an old correspondent would wish to ask, can the force of the magnet be made so strong as to be applied to a sewing-machine or to locomotion? and if you could procure an outline drawing, and give in the *Builder* a small wood engraving of this curious machine, no doubt it would much oblige your readers.

A BIG HAMMER.

A seventy-ton cast-iron block being required for a steam hammer, and being undertaken with other works by Mr. Wm. Williams, ironfounder, St. Helen's Works, Swansea, was successfully cast on the 11th inst. Two cupolas were specially erected at a suitable distance to enable the metal to run directly into the mould. Operations commenced at an early hour, and by a quarter to ten a.m. the first set of charges were ready and tapped. Successive charges followed each other at regular intervals of three-quarters of an hour up to nine p.m., at which time the block containing the full weight of 70 tons of solid iron was finished, thus successfully completing the largest casting ever made in Wales.

The dimensions are 11 ft. 6 in. by 9 ft. 6 in. at base, and 7 ft. 6 in. high. It will occupy from two to three weeks to cool sufficiently to allow it to be reversed, it having been cast base uppermost.

THE NEW EXCHANGE BUILDINGS, LIVERPOOL.

This extensive and important fabric is now far advanced towards completion. The present works, contract No. 2, include the whole of the east wing and the central portion, and are being carried out by Messrs. John Parker & Son. Mr. Wyatt is the architect. A portion of the quadrangle will very shortly be completed. The excavation through the hard red rock has proved a tedious and arduous process, but with the aid of Taylor's steam-hoist the labour has been materially reduced and the work expedited, as it has enabled Mr. Abraham Thomas, the contractor for this portion of the work, to remove blocks weighing from three to five tons each. This excavation has proved an exceedingly interesting and important portion of the whole work, and will provide for the construction of two tiers of vaults, well ventilated. The space at present left open in the centre of the north side of the quadrangle is for the central tower, the building of which will be proceeded with as soon as the temporary Stock Exchange and Telegraph-office have been removed. The upper part of this tower will be made available for a grand picture-gallery, lighted from the roof. It will be 62 ft. long by 34 ft. wide, and access to it will be afforded by a large passenger-lift. The circular tower at the north-east angle of the building will add to the apparent height of the edifice at this point. When completed, which it nearly is already, this tower will form a feature in the general aspect of the building. The whole of the fabric is under the superintendence of Mr. Jonathan Parsons.

CABINET-MAKERS IN LONDON.

I am very glad to hear that there are now a great number of respectable firms who procure good drawings of cabinet-work and get the designs executed. That they look less to the quality of the work than to their full profit is, I think, a very bad sign; but permit me to ask, who supplies the designs,—architects or artists? and are they paid for? Are they not rather furnished by the workman as a condition on getting the order to execute, and that, too, without other fee or reward? And if a workman once gives evidence of his ability to devise something new either in style or material, is he not continually pestered with, "So-and-so, can't you give us something fresh?" Sir, the present race of mere dealers must die out. The motto the public should adopt is "Buy of the maker." Let the man who wants a piece of furniture, or anything else, I care not what, if it is to be satisfactory either artistically or constructively, bring his mind in direct contact with the mind of the producer, and an advantage would ensue which is not to be measured by any money value.

E. C.

EQUATORIAL DIALS.

Sir,—As I said "the most natural, most obvious, and best" way to treat sun-dials was the ancient one of making all their *surfaces* "parallel *or* perpendicular to the equator," I do not see why it should be necessary to answer Mr. Scargill's inquiry about a "sun-dial parallel to the equator," a thing I never mentioned; but if he takes the trouble to make one on the "surfaces,"—I never said *surface*,—parallel thereto, he will find that not only does the southern face act exactly as well all the time the "sun is beyond the equator," as the northern while he is on this side, but "at the equinox," or any time within several hours thereof, *both* faces will receive shadows at once, half, nay, a quarter or a tenth of the sun affording ample light for this purpose; just as the east and west walls of a building are, for two minutes, both shone upon, or as both poles of the earth may be proved, at the same equinox time, to be in sunshine for some three days together; in this case, indeed, not merely having *half* his disc, but (owing to refraction) the *whole* of it, well lifted above both their horizons. For the same reason, at our sunrise or sunset, there are at least four minutes, and often many more, during which we and our antipodes can both see his entire disc.

And this leads me to remark, it is a mistake to place dials where they can be shone upon till sunset, for refraction must greatly vitiate their time-keeping whenever the sun is no higher than a few, say five, degrees. Nor does this admit of any self-acting correction like the other inequalities. Hence it is useless to graduate a dial beyond 16 hours for any part even of Scotland, or up to 16 for the south of England.

* * * *

E. L. G.

"ROYD."

Sir,—The word "Royd" is of frequent occurrence in names of places in this district (Bradford, Yorkshire); as Abbot Royd, Brook Royd, Clay Royd, Hood Royd, How Royd, Raw Royd, Swain Royd, Lady Royd, Nun Royd, Stony Royd, and many others. Will you be so kind as to give me its meaning? R. C.

LOCAL BOARDS OF HEALTH AND THEIR CHOICE OF SURVEYORS.

Sir,—A friend of mine, a duly qualified civil engineer and surveyor of considerable practical experience, has, with great assiduity, for some time applied himself in trying to obtain an appointment as above.

Strange to say, with respectability of character and excellent credentials as to ability, &c., no response has ever been made to his numerous attempts. This has led me to the inquiry, upon what principles do these bodies gauge the qualifications of their applicants?

It is within my knowledge that parties have been selected and sent for who know as little of the use of the level, taking and drawing a section, making a road, and other professional duties necessary to their efficiency, as a schoolboy might be expected to do.

Are there no means that can be devised by which the competent and orthodox surveyor can be properly recognized, and have some guarantee against this haphazard election of one and the rejection of others with as little respect to their fitness as to their feelings?

I shall be glad if my brother professionals would give the subject consideration, and point out for the benefit of electing bodies means calculated to protect the interests of our fraternity, Out of Adjustment.

A NICE LITTLE BILL.

Sir,—You are so frequently requested to give some portion of your space to inquiries as to the best mode of preventing damp penetrating through the walls of newly-built houses, that you will probably extend your good nature to this communication which will unfold a certain cure, although many of your readers may fancy it has its drawbacks. Briefly, the method of proceeding, in a recent case, was as follows:—Miss J. requested a plumber to remedy a portion of a damp wall over a bay window in one of her lodges. The work was done, the damp stopped, and the account sent in; but as it was more than she thought such a thing ought to have cost, she sent for an architect, giving him an idea of the affected place in the lodge, and asking him what he supposed the cost of such work. His idea was from 3*l.* to 5*l.*; the bill was produced of 51*l.* The ingenious tradesman had fixed a framework of wood over the gable down to the bay window. Upon this he fixed his lead, one strip weathering the other. A small window in the gable, with stone jambs and mullion, did not escape, as the jambs and mullion were carefully encased with lead, the poor little building presenting a most woe-begone aspect. Should any of your non-professional readers be troubled with damp walls, I should advise them to try your mixture of alum and soap before giving instructions to a plumber, or they may have to pay dearly for their whistle through his pipes. I enclose a copy of the bill. A. S.

CLOSED DOORS, SOUTH KENSINGTON.

Sir,—I thank your correspondent "Art-Lover" for his explanation that the "museum proper" is not closed at four o'clock on Saturdays; but—like an apologist often—he goes too far, and proves too much for his own purpose.

First, he speaks slightingly of "a *portion* of it" as "a mere annexe where the models of ships are exhibited." Would any one imagine that this meant the wonderful collection of armour so admirably arranged, and so interesting to the public, that when the doors were closed upon me and hundreds of others at four o'clock, there was a general undertone of disappointment? Again, would one suppose that the doors to the Museum "proper" in Exhibition-road were closed at this same time? I thank him for his advice to ask the very civil policemen; but I venture to think that I know at least as much as they do of what the Museum contains, and have visited it sufficiently often not to require to ask "if there is anything more to be seen."

Your correspondent supposes I am condemning Mr. Cole; on the contrary, I so value the distinguished services of that gentleman on behalf of the public, and his sympathy with all public wants, that I felt sure—had he been there at the time to see—he would have regretted the regulations as to closing this Armour Gallery on Saturday afternoons at four o'clock (even in March) as much as your correspondent, and would have altered them at once.

One Disappointed.

THE NEW STEAMBOAT PIERS.

Sir,—Great improvements are undoubtedly being made to the river side between Westminster Bridge and the Temple by the substitution of the new steamboat piers for the old racketty broken-down dummies of bygone times; but these new piers lack one thing.

I was going up the river the other day from London Bridge to Westminster by boat, and during the passage was inquired of by several people which was this pier and which was that. It struck me at the time what an advantage it would be to strangers and the public generally if the Thames Conservancy, or whoever have the management of these piers, would have the names of them painted legibly on a board as at railway stations, and placed in positions where they may be seen by everybody on the arrival of the boats. J. C. D.

Books Received.

"The Year Book of Facts in Science and Art." By John Timbs. London: Lockwood & Co.—The present issue of this long-established and interesting annual is illustrated with an engraved likeness of Mr. Whitworth, the gun inventor, and scholarship founder. There is also a brief memoir of Mr. Whitworth.——"Thames Valley Drainage Outfall." Plan proposed by Sidney J. Hervon Herrtage, C.E. Mr. Herrtage is surveyor to the Surbiton Improvement Commissioners. He proposes to deal with the sewage of the following towns and villages;—Richmond, Petersham, Twickenham, Ham, Teddington, Kingston, Surbiton, Long Ditton, Thames Ditton, Hampton Wick, Hampton Court, Hampton, Sunbury, Walton, Weybridge, Halliford, Shepperton, Chertsey, Addlestone. This he would do by carrying the sewage back from Richmond, along the course of the river, or nearly so, by the aid of two lifts, one at Kingston and the other opposite Walton, to a pumping station near Chertsey, where it would be lifted 150 ft. from a reservoir containing six hours' flow of sewage and rainfall, and forced through a 36-inch cast-iron main under the Thames, to irrigation farms, which it appears would be available between Chertsey, Woking, and Egham. The total estimate for all the works comprised in this plan is, in round numbers, 167,000*l.*——"British Railways as they are and as they might be: Suggestions as to Cheap and Uniform Fares, with Increased and Guaranteed Dividends." By John Imray, M.A., C.E. London: Spon. This is a modification of Mr. Raphael Brandon's plan. Mr. Imray proposes a division into short and long fares,—the short, for say twenty-five

miles less or more, at 1s. first class, 6d. second, and 3d. third; and the long, all above that distance, at 16s., 8s., and 4s.; luggage tickets for any distance, 1s. The management of railways to be in the hands of a Government department, and tickets to be issued, like postage-stamps, at any stamp or post office. Mr. Imray calculates that even on the present number of passengers there would by this system be a gain of more than 2,000,000*l.*, exclusive of luggage and parcels. Travellers for short distances beyond twenty-five miles, he calculates, would take short-distance journeys, and so save their money, as indeed they might do by repeating their short distances again and again. One defect of Mr. Brandon's plan, he urges, would be, that in journeys of any considerable length, passengers generally would become first-class, preferring soft and comfortable seats for 1s. to inferior ones for 3d.; so that the distinctions of class would be nugatory. The author's plan is further elaborated in the pamphlet under notice.——"Engineering Facts and Figures for 1868." London and Edinburgh: Fullarton & Co.—The present issue of this annual compilation chiefly relates to boilers and boiler explosions, furnaces, engines, naval construction, &c.

Miscellanea.

Hydrogenium — a Metal.—At the Royal Society's *conversazione*, Mr. W. C. Roberts (for Mr. Graham, the Master of the Mint), exhibited a curious example of the absorption of hydrogen by palladium, and consequent alloy and expansion of the metal. A coiled ribbon of palladium was attached to each pole of a small battery in a water bath. The current being turned on, the ribbon absorbs hydrogen, expands, uncoils, and stretches itself across the bath; then, on reversal of the current, shrinks, and reforms its coil, while the opposite ribbon goes through the opposite process. The appearance is that of two worms wriggling alternately to and fro across the bath. In another instance the expansion was shown by a red-tipped arrow making bold sweeps half round a circle. These experiments demonstrate the enormous capacity of palladium for absorption of hydrogen, and verify Mr. Graham's conclusions. It is a singular fact, that the true alchemists appear to have been aware not only of the existence, but of the metallic nature, of hydrogen, which they called their celestial mercury, and prime matter of metals. They speak, for example, of rotting or corrupting a "metallic sulphur," by means of distilled water, till the "mercury" enters into "companionship" with the sulphur, leaving the "stony crassitude" in the fæces; which, translated into modern chemical language, obviously just refers to the decomposition of a metallic sulphuret, such for example as sulphuret of iron, into sulphuretted hydrogen, on the one hand, and iron oxide, on the other; and it also clearly shows that they were well acquainted with oxygen as well as with hydrogen, and with the fact that water is composed of these two elements, the *separation* of which, by means of a metallic sulphuret, into sulphuretted *hydrogen* and metallic *oxide*, they thus distinctly although quaintly indicated.

Burlington House.—In the House of Commons on Monday, Lord R. Gower asked the Secretary of State for the Home Department whether the structure connecting Burlington House with Piccadilly was a temporary erection; also what was the proposed destination of the colonnade recently removed from the front of Burlington House. Mr. Knatchbull-Hugessen (in the absence of the Home Secretary) said that the structure referred to in the first part of the question was purely temporary; and with regard to the colonnade, its final destination, he believed, had not yet been determined upon.

The Asylum for Idiots.—The asylum at Earlswood was designed originally for 400 inmates. At present some additions have been made, and it is desired to enlarge the asylum so as to enable it to receive 800 inmates. This addition would cost 10,000*l.*, and between 9,000*l.* and 10,000*l.* have been already subscribed, and about 1,500*l.* more promised. The Prince of Wales has consented to lay the first stone of the new building on his return from Egypt. A lady has also offered to give 100 guineas, provided nineteen others will give a similar sum each. She offers to consider any two gifts of 50 guineas as one of 100. Four sums of 100 guineas and five of 50 guineas have already been promised.

Royal Horticultural Society.—The first spring show of the Royal Horticultural Society of the present year was held in the Gardens on Saturday last, when there was a wonderful collection of hyacinths, cyclamens, roses, and other spring flowers. The Dutch growers gave supplemental prizes amounting to 45*l.*, which caused a very keen competition among the various exhibitors. The attendance was large, and the whole affair a success.

Gas.—The Hastings Gas Company have declared a dividend at the rate of 8 per cent. per annum for the last half-year on old shares, and 7 on new, as at the two preceding half-yearly meetings, leaving a balance. There is a duty of 2s. 4d. a ton on coal at Hastings, which duty costs the company about 1,000*l.* a year.——The Minster Gas Company have declared a dividend of 5 per cent. for the last year. A dividend of 6 per cent. was proposed, but the chairman said he preferred reducing the price of gas.——Some alterations are about to be made at Carlisle Gas Works. The engine-house is to be enlarged; two new engines substituted for that which is now in use; and a new "washer-house" (in which the gas undergoes a purifying process) erected. The erection of a new chimney 150 ft. high is also in contemplation. The present chimney, which serves Messrs. T. & J. Nelson, Mr. Brockbank, and the Gasworks, stands in the middle of the street, and is found to be inconvenient in that position. The corporation have the right to pull this chimney down, upon giving certain notice to the joint-proprietors, and paying them 200*l.*

Industrial Employment of Criminals.—The Howard Association has issued a printed note of desiderata in criminal treatment, with illustrations and suggestions. One especial point urged is the industrial training of criminals. It is a shame to the Legislature, and a gross injustice to tax-payers, that nothing is done in this respect. Criminals ought, for their own sakes, as well as for the sake of the public, to be trained in industrial employment while in prison. Tread-mills, which "grind the wind," are liker a lunatic invention than one of sane origin. The objects of the Howard Association ought to be supported by the tax-paying public at large, and by all who have anything to lose or to suffer by the misconduct of criminals. The office of the Association is at 5, Bishopsgate-street Without, and the secretary is Mr. W. Tallack. Earl Russell and other influential persons are patrons of the Association.

Eton College.—On the 13th inst. the Provost of Eton delivered a lecture in the College Audit-chamber on the "Archæology of Eton." On the table of the apartment in which the assembly was held there was laid a collection of the most ancient and noteworthy documents relating to the foundation. Taking these for his subject, the Provost commenced by showing how amply they witnessed to the munificent intentions of the founder. In the handwriting of Henry VI. there were directions as to the dimensions of the chapel, which in all respects he desired should be superior to those of its Winchester rival, New College, Oxford. The misfortunes of the King, however, frustrated the accomplishment of his designs, and his successor, Edward IV., so far from inheriting his partiality for the new creation, was anxious to transfer the entire property of Eton to the Dean and Canons of Windsor. One of the most remarkable, as one of the most tattered among the papers lying before the audience, was an inventory of the property which was ordered to be surrendered in this way. An appeal, however, was made to Rome, the hearing of which was remitted to England, and the result was that the College retained all that belonged to it, without giving any permanent annoyance to Edward, who subsequently appears as a benefactor. The Provost concluded at the date of Oliver Cromwell, who, he remarked, was the last to contribute the royal gifts of game and wine, which had previously been annual,—a neat hint.

A "Steeple Jack."—For some days Mr. Jason Goodchild, *alias* Steeple Jack, from Dundee, has been attaching lightning conductors to the tower and gables of the hydropathic establishment at Crieff. The tower is about 100 ft. high, and the flagstaff thereon is 40 ft. At this height—some 140 ft.,—Jack thought proper to balance himself with one foot resting on the top of the flagstaff. Here he stood till his photograph was taken, and thereafter waved his cap while the flagstaff was swinging in the breeze.

The Durometer.—An instrument for testing the hardness of metals, by drilling, has been invented by M. Behrens, an engineer of Tarbes, in France. It is said that it has been thoroughly tried, and that many French contracts for rails now contain a condition that they are to be tested by this apparatus. It consists of an upright cast-iron standard, bolted down upon a bed-plate, and provided with a table for supporting the rail or other article to be tested. The spindle of the drilling tool is capable of being raised and lowered in its bearings by turning a handle for that purpose, and the drill is held down to its mark by a weight fitted to the upper end of the drilling spindle. Its rotary motion is derived, through a pair of mitre wheels, from a driving shaft carrying the usual fast and loose pulleys. This shaft has a worm upon it which moves a train of mechanism, in connexion with a signal gong, for the purpose of indicating the number of revolutions made by the drill. The apparatus is exceedingly compact. Its use by French manufacturers has led to a gradual increase in the hardness of the rails they produce.

Royal Italian Opera, Covent-Garden.—Any doubt that existed as to the union of the two managements and the two companies, those of Covent-Garden and Her Majesty's, has been dispelled by the published programme, which sets forth the double company wonderfully strong on the lady side, but wanting on the other a great tenor, spite of Mongini and the return of Tamberlik. But where is he to be found? Signor Arditi will be conductor, with a colleague not yet named, and the Covent-Garden orchestra remains intact. Only one opera new to London is spoken of, Ambroise Thomas's "Hamlet," with Mdlle. Christine Nilsson as Ophelia; but, on the other hand, some promising conjunctions in stock operas are promised; such, for example, as "Le Nozze di Figaro," with Patti as Susannah, Lucca as Cherubino, and Titiens, La Contessa. The subscription list can scarcely fail to be very large.

"Cleopatra's Needle."—The prostrate obelisk in Egypt that belongs to us has again turned up, and one more suggestion is made, that we ought to bring it to England. Our readers will remember the agitation of the question in our pages some years ago, when one of our correspondents, the late Mr. Nathaniel Gould, offered to fetch it to England for a certain stipulated sum. Nothing came of the proposition, then, however; nor will it now. Under ordinary circumstances we are not advocates for the removal of historical monuments from their original site.

Transplanting a Large Tree.—At Elveden Hall, the seat of the Maharajah Dhuleep Singh, considerable interest has been excited by the successful removal of a very large tree, under the superintendence of Mr. Barron, of the Elvaston Nurseries, Derby. The remarkably fine specimen of purple beech thus transplanted is nearly 50 ft. high, the diameter of the branches 58 ft., and the circumference of the stem at about a foot from the ground, 7 ft. 8 in. The mass of soil and undisturbed roots measured 16 ft. by 14 ft., the roots extending 6 ft. beyond, and the whole weighed considerably over twenty tons. A platform of strong timber was constructed underneath, and the tree was raised upon rollers laid on planks by means of powerful screw-jacks. This being done, the tree was drawn on to its new site with the aid of pully-blocks of unusual size, being maintained throughout in an upright position.

Frightful Explosion at Oldbury.—An explosion, by which two men instantly lost their lives and several others sustained serious if not fatal injuries, has occurred at the works of Messrs. Demuth & Co., at Oldbury, manufacturers of naphtha and other chemicals from gas tar, including, amongst other things, the celebrated aniline dyes. The cause of the accident does not appear. The retort is of enormous weight, and was blown through the air to a distance of about forty yards, "like a balloon." The amount of damage will amount, it is said, to 3,000*l.* or 4,000*l.*

Earthquake in Lancashire.—A shock of earthquake was felt on Monday evening in Manchester and the neighbourhood. At Newchurch a factory chimney was destroyed, and the shock was severely felt at Todmorden, Rawtenstall, and Haslingden. The wall of the railway station there was cracked.

The Drainage of Reading.—At a meeting of the Local Board it has been unanimously resolved, that a drainage scheme, involving an expense of 40,000*l.* shall be carried out. Mr. Lawson, C.E., and Mr. Woodman, the borough surveyor, have, for some time past, been engaged in maturing the plans for the work, and these plans will now be forwarded to the Home Secretary for approval before the money can be borrowed. According to a statement made by Mr. Simonds, a 6d. rate spread over a period of thirty years will pay both principal and interest. As the Thames Conservancy Board have determined to enforce the powers they possess by Act of Parliament, of compelling all towns in the valley of the Thames to divert their sewage from the river, no option is left but to convey the sewage to the land, and this plan will be adopted at Reading. Owners of property will be compelled to connect their drainage with the main sewer, but time will be given for payment for the work, which must be executed subject to the supervision of the borough surveyor.

Election of a Surveyor for Leominster. The town council, sitting as a Board of Health, met recently for the purposes of receiving applications, and of electing a person to fill the office of surveyor, at a salary of a "pound a week," the person undertaking the duties to be allowed to execute certain other work not to the detriment of his office. There were eleven applications, including seven local names, and the Board, having opened all the applications, ostensibly formed themselves into a committee, and proceeded to the election with closed doors, the result of their labours being the selection of Mr. John Edwards, of Stourbridge.

The Southampton Statue of Lord Palmerston.—A difference of opinion has arisen between the local Palmerston Memorial Committee and the Town Council as to the site for the statue. The Town Council, by a majority of 19 to 9, have refused to allow it to be put up on the place recommended by the committee, in the High-street, near Holy Rood Church. The editor of the local *Independent* says he regrets this decision, because he knows of no better place. As to any interested motives on either side, he discards the idea.

Destruction of Durham Theatre by Fire.—The Theatre Royal, in Saddler-street, Durham, has been totally destroyed by fire. The building had been used for some time as a music-hall. It contained a large quantity of dried timber. The cause of the fire is unknown. It appears that smoking was allowed in many parts of the house. The building has been in existence over 100 years.

Chatham.—The contract for the erection of the new Lock Hospital intended to be built by the Government, in Chatham, has been taken by Mr. P. Stiff, builder, of Dover, for the sum of 7,749*l.* The hospital will be built on the Government land adjoining the Maidstone-road.

The Adelaide Gallery, Strand, Destroyed by Fire.—The Adelaide Gallery, once known to fame, like the Polytechnic, as a seat of popular science, but latterly occupied by Messrs. Agostino Gatti & Monico as a *café*, has been destroyed by fire. Adjoining houses were somewhat injured.

The Wages Question.—This question has presented itself at Preston in a somewhat singular form. A number of spinners, who have enjoyed parochial relief, have been deprived of that privilege on the ground that they could obtain work in the town. Their answer is, that they can only do so by accepting reduced wages. The guardians allege that this is not a point with which they have anything to do; while the employers justify the lower rates on the ground that the depressed condition of the cotton trade prevents them from giving more.

Railway Traffic Returns.—The traffic receipts of railways in the United Kingdom for the week ending February 28th amounted, on 13,420 miles, to 703,183*l.*, and for the corresponding week in 1868, on 13,216 miles, to 679,364*l.*, showing an increase of 204 miles and of 23,819*l.*

The Thames Embankment Approaches. A petition has been presented to the House of Commons, by Mr. W. H. Smith, from the vestry of St. Paul, Covent-garden, for the provision of suitable approaches to the Embankment from the Strand, between Norfolk-street and Villiers-street.

The South Staffordshire Industrial and Fine Arts' Exhibition.—The various preliminary works, for the opening of this exhibition in May next, are rapidly approaching a state of completeness, and the matter is being now taken up by the manufacturers generally throughout the district with heartiness and zeal. The timber framework of the special building is completed, and a large portion of it covered in; the ground floor is laid, the galleries are erected, and the contractor (Mr. F. N. Clarke) expected to have the whole building completed by the time specified, the 15th instant. Notwithstanding the large dimensions of the building—150 ft. long by 80 ft. broad, and 43 ft. high, the committee will experience some difficulty to satisfy all the demands that are now being made upon them, and a suggestion has been generally agreed to that another temporary structure should be erected in the lower part of the grounds in which to exhibit machinery in motion: the exhibits in this department will include ribbon looms from Coventry, nailmaking machines, &c. The dimensions of the structure will be about 100 ft. by 30 ft. The arrangements for the fine art department, which are under the special management of the Earl of Dartmouth, are likewise being carried out with success. Instructions have been given to Mr. Wadsworth, of Manchester, for the erection of a grand orchestral organ, which is to be fixed in the gallery at the end of the main building.

National Educational League.—A league, having for object the establishment of a system which shall secure the education of every child in England and Wales (and why not Ireland also?), is in course of formation in Birmingham. Mr. George Dixon, M.P., is the chairman of the provisional committee.

TENDERS.

For engine-sheds, &c., New Cross, for the London, Brighton, and South Coast Railway. Mr. F. D. Bannister, engineer:—

Blackmore	£17,900 0 0
Myers & Sons	16,363 0 0
Pickering	16,310 0 0
Firbank	16,200 0 0
Chappell	15,950 0 0
Jackson & Co.	15,827 0 0
Sherburn	14,600 0 0
Dickinson & Oliver	14,468 0 0
Perry, jun.	14,347 0 0

For finishing a house at Cremorne New-road, including additional rooms and vaults, for Mr. Cowley. Mr. J. S. Moye, architect. Quantities not supplied:—

Reed	£1,048 17 0!
Rudkin	665 0 0
Sapwell	657 0 0
Stocks	557 14 0
Howlett	381 0 0!

[Who will explain this?]

For extensions to the Roman Catholic Institution for Deaf and Dumb Boys, Cabia, near Dublin. Mr. Charles Geoghegan, architect:—

Murphy	£5,025 0 0
Nolan	4,568 0 0
Hammond	4,361 0 0

For the erection of house and shop, Peckham-grove, Camberwell. Mr. J. Coe, architect:—

Richardson	£779 10 0
Turner	758 0 0
King & Sons	751 10 0
Morter	746 10 0
Smith	723 0 0

For various works to premises, 107, Leadenhall-street. Mr. W. Eve, architect:—

Lowe	£928 0 0
Izer	881 0 0
Browne & Robinson	847 0 0
Brass	846 0 0
Newman & Mann	816 0 0
King & Sons	694 0 0
Turner	659 0 0
Turner, jun.	639 0 0

For a villa residence at Harbledown, near Canterbury, for Mr. J. Callaway. Mr. M. C. W. Horne, architect:—

Langmead & Way	£2,810 0 0
Macey	2,639 0 0
Gaskin & Godden	2,750 0 0
Wilson	2,498 0 0
Cozens, Brothers	2,345 0 0

For erecting New Southern Hospital, Liverpool, to contain 200 beds. Messrs. Culshaw & Summers, architects. Quantities supplied:—

Callie	£31,039 0 0
Parker & Son	29,500 0 0
Black & Readdie	27,835 0 0
Burroughs & Son	27,546 0 0
Tomkinson	27,373 0 0
Hughes	27,200 0 0
Haigh & Co.	26,694 0 0
Holme & Nicol	26,563 0 0
Jones & Son	26,123 0 0
Armson	25,839 0 0
Nicholson & Ayre	25,700 0 0
Rome (recommended to the general committee for acceptance)	25,154 0 0

For alterations to No. 24, Piccadilly, for Messrs. Unwin & Albert. Mr. Frederick Sullivan, architect:—

Cock	£232 0 0
Drew	227 0 0
Saunders (accepted)	194 0 0

For alterations at 687 and 689, Old Kent-road, for Mr. W. Stark. Mr. E. Aldous, architect:—

Snelling	£285 10 0
Stark	285 0 0
Dennis	284 9 5
Croaker & Son (accepted)	239 0 0

For two houses, Keynsham, exclusive of boundaries, &c. Mr. E. A. Lansdowne, architect:—

Eastabrook & Son (accepted)	£1,091 0 0

For alterations and additions at West End, Hampstead, for Mr. T. E. Ripley. Messrs. Parr & Strong, architects:—

Cox	£876 14 1½
Simpson	747 0 0
I'Anson	744 0 0
Ramsey	735 0 0
Tracey	733 0 0
Wheeler	720 0 0
Robinson	598 0 0

For new wing to the Baker and Basket Tavern, St. James's-street, Old Kent-road, for Mr. Langsford. Mr. E. Aldous, architect:—

Morris (accepted)	£230 0 0

TO CORRESPONDENTS.

W. G. S.—C. F. H.—A. S. E.—W. F.—A. M.—Q—Z—T. R. S. T.—J. H.—F. D.—J. W. P.—W. H.—G. W. S.—W. W.—P. & S.—Dr. T.—G. S.—R. C.—T. S.—J. T. D.—H. T—E. J.—E. G.—One whose Chimney Smokes.—W. B.—P. B.—M.—F. R. W.—B. B. S.—K. R.—W. B. S.—Capt. P.—L. & Co.—C. G.—E. L. G.—K. & Sons.—One who has been a Rough Boy.—C. G.—P.—J. W.—W. S.—C. P. (shall appear first opportunity).—A. C. H. (we had useless journey).—Lustrans next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

GOOD FRIDAY.

NOTICE.—"THE BUILDER," for the week ending MARCH 27th, will be published at TWO p.m. on THURSDAY, 25th inst. Advertisements for insertion in that Number must therefore reach the Office **before THREE** p.m., *on WEDNESDAY, 24th.*

TO SUBSCRIBERS.

The Publisher cannot be responsible for ORIGINAL TESTIMONIALS *left at the Office in reply to Advertisements, and strongly recommends that* COPIES ONLY *should be sent.*

☞ *NOTICE.—All Communications respecting Advertisements, Subscriptions, &c., should be addressed to "The Publisher of the Builder," No. 1, York-street, Covent Garden. All other Communications should be addressed to the "Editor," and* NOT *to the "Publisher."*

BUENOS AYRES GOVERNMENT CERTIFICATE. — TRANSLATION. — We, the undersigned, at the request of Messrs. Jas. C. Thompson & Co., certify that the IRON SAFES of Messrs. CHUBB & SONS, London, of which these gentlemen are agents, were exposed for several hours to the fire that took place in the offices of the National Government on the evening of the 26th inst.; that in our presence they were easily opened with their respective keys; that the moneys and important documents they contained were found in perfect order; and that these safes are now in use in the National Treasury Office.—(Signed) J. M. DRAGO (Treasurer of the National Government), JOSE TOMAS ROJO, JUAN M. ALVAREZ. A true copy—A. M. BELL.—Buenos Ayres, July 31, 1867. CHUBB & SON, makers to the Queen and the Bank of England, 57, St. Paul's-churchyard, London; 68, Cross-street, Manchester; 28, Lord-street, Liverpool; and Horsley-fields, Wolverhampton.

IMPROVED MACHINERY, combined with STEAM POWER, is employed by J. W. BENSON in the Manufacture of Church, Turret, Stable, and Tell-tale Clocks, Sun and Wind Dials, Perpetual Calendars, and every description of Clock and Watch Work. Architects, Builders, Committees, &c. can be promptly supplied with estimates. A descriptive Pamphlet on Church and other Clocks, post-free, 2d. J. W. BENSON, by special appointment, Watch and Clock Maker to His Royal Highness the Prince of Wales. Steam Factory for Clocks and Watches, 58 and 60, Ludgate-hill; Showrooms, 25, Old Bond-street, London.